

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

اختبار شهر اكتوبر



States of Matter

What is meant by ?

Matter	Everything that has mass and occupies space.
Fluids	Materials that have the property of fluidity and take the shape of the container that contains them.
Fluidity	The ability of fluids to flow easily.
Compressibility	The possibility of decreasing the volume of gases by increasing the pressure exerted on them.
Diffusion	The movement of the particles of matter from a region of high concentration to a region of low concentration.
Brownian motion	The random motion of relatively large particles suspended in a fluid in all directions as a result of their continuous collisions with the molecules of the fluid.
Plasma state	The fourth state of matter in which the gas becomes a mixture of positively charged ions and negatively charged free electrons.

Give reasons ?

① The difference between the flow rate of honey and the flow rate of water.

Because the viscosity of honey is higher than that of water, as the fluidity decreases with increasing viscosity.

② The diffusion of fragrance during the day is better than its diffusion at night.

Because the temperature during the day is higher than at night, the speed of diffusion increases with the rise in temperature.

③ Solids have a definite shape and volume.

Because the forces of attraction between its particles are very strong, and the interparticle spaces between them are very small.

④ Liquids have indefinite shape and a definite volume.

Because the forces of attraction between its particles are relatively weak, and the interparticle spaces between them are relatively large.

⑤ Gaseous matter does not have a definite shape or volume.

Because the forces of attraction between its particles are very weak, and the interparticle spaces between them are very large.

6 Difficulty of breaking a piece of rock.

Because the forces of attraction between the particles of solid rock are very strong, and the interparticle spaces between them are very small, which makes the particles tightly bound together.

7 Dissolution of table salt in water.

Because the forces of attraction between the particles of liquid water are relatively weak, and the interparticle spaces between them are relatively large, so they occupied by the table salt particles.

8 The diffusion of candle smoke in the air.

Because the forces of attraction between the particles of air are very weak, and the interparticle spaces between them are very large, so smoke particles diffuse in it.

Compare between ?

1	Solid matter	Liquid matter	Gaseous matter
Change in shape when the container is changed	Its shape does not change (Its shape is fixed and definite)	Its shape changes (It takes the shape of the container which contains them)	Its shape changes (It takes the shape of the container which contains them)
Fluidity	Does not have the ability to flow	Have the ability to flow, depending on its viscosity	Have the ability to flow
Compressibility	It is incompressible	It is incompressible	It is compressible
Change in volume due to compression	Its volume does not change (Its volume is fixed and definite)	Its volume does not change (Its volume is fixed and definite)	Its volume decreases (It takes the volume of the container which contains them)
Speed of diffusion through it	Very slow	Average speed (moderate)	Very fast

2	Ice water	Liquid water	Water vapour
Particle motion	Vibrates in its fixed position	Moves more freely	Moves randomly and completely freely
Interparticle spaces	Very small	Relatively large	Very large
Forces of attraction between particles	Very strong	Relatively weak	Very weak

What happens when ?

- ① A few crystals of potassium permanganate are added to a beaker containing an amount of water.

The potassium permanganate particles diffuse in the water from the region of high concentration to the region of low concentration.

- ② A spoonful of sugar is stirred in a cup of water.

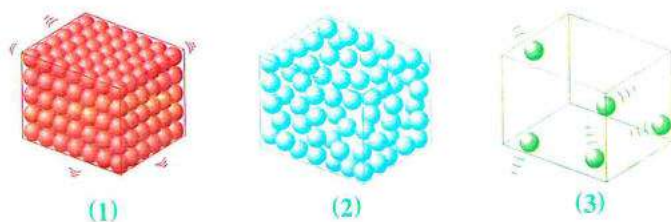
The sugar particles occupy the interparticle spaces between the water particles, which leads to the dissolving of sugar in water.

- ③ Gases are heated to extremely high temperatures in a research laboratory.

The gases become ionized, forming plasma (the fourth state of matter).

Study the following figures, then answer ?

The following figures represent the particles of matter in its three states:



(1) What physical state is represented by each figure?

(2) Which of these figures represents a fluid?

Answer

(1) (1) : Solid state.

(2) (2) : Liquid state.

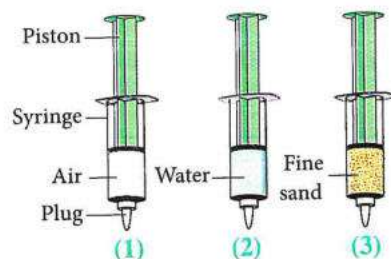
(3) (3) : Gaseous state.

(2) Figures (2), (3).

From the opposite figures:

(1) What happens when the piston of each of the three syringes is pressed?

(2) What can be concluded from this activity?



Answer

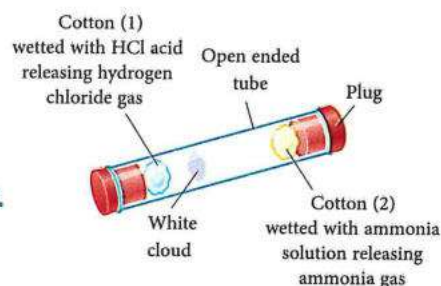
- (1) * (1) : Air is compressible and its volume decreases.
* (2), (3) : Water and fine sand are incompressible.

(2) We conclude that:

- * Gaseous matters can be compressed (their volume decreases).
- * Liquids and solids are incompressible (their volume does not decrease).

The compression of gases reduces the total volume of the gas without changing the volume of their particles themselves

 The opposite figure shows the experiment of the diffusion of both ammonia gas and hydrogen chloride gas, hence the formation of a white cloud when the two gases meet together.



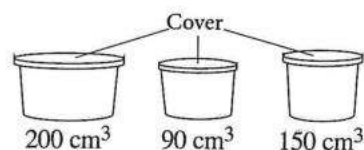
- (1) Which gas diffuses faster? Explain.
(2) Which gas its molecule has greater mass? Explain.

Answer

- (1) Ammonia gas diffuses faster than hydrogen chloride gas, because the white cloud is formed nearer to the cotton (1) which wetted with HCl acid.
(2) The mass of a hydrogen chloride molecule is greater, because its speed of diffusion is lower.

The speed of diffusion of gas molecules increases as their mass decreases, and vice versa

 Which of the opposite vessels can hold 180 cm^3 of air? Explain your answer.



Answer

All vessels / Because air is a gaseous substance that takes the volume of the container which contains it, it can occupy 200 cm^3 and can be compressed to occupy 150 cm^3 or 90 cm^3

Variant questions ?

Q1 State four assumptions of the particle theory of matter.

- A**
- (1) Matter is composed of very small particles that cannot be seen with the naked eye.
 - (2) The particles of a single type of matter are identical, but they differ from one substance to another.
 - (3) The particles of any substance store potential energy due to the existence of attraction forces present between them.
 - (4) There are spaces between the particles of any substance called interparticle spaces, which vary depending on its physical state.
 - (5) The particles of any substance have kinetic energy because they are in a state of continuous motion in straight lines.
 - (6) The way of movement and the speed of the particles differ, based on the physical state of the substance.

Q2 When gases are heated to extremely high temperatures, the fourth state of matter is formed:

- (1) What is the name given to this state of matter?
- (2) What are the characteristics of this state?
- (3) Where can this state be exist?

- A**
- (1) Plasma state.
 - (2) It is characterized by its high electrical conductivity.
 - (3) **It exists in:**
 - * Most of matter in outer space, such as in the Sun, stars, and cosmic nebula.
 - * Lightning.
 - * The Aurora borealis (polar Aurora).

Q3 Mention a technological application for plasma state, explaining its working principle.

- A**
- Air conditioning systems for improving the air quality in enclosed spaces.
 - **How they work:**
 1. Gases are passed through a high electric field to convert their atoms into positively charged ions and negatively charged free electrons.
 2. The charged gas ions break down harmful air pollutants, germs, and viruses, this make the air more pure.

What is meant by ?

Sublimation process	The change of a substance directly from the solid state to the gaseous state without passing through the liquid state.
Deposition process	The change of a substance directly from the gaseous state to the solid state without passing through the liquid state.
Dry ice	Carbon dioxide in its solid state.
Hydrology	Science of studying water.

What happens when ?

1 The liquid substance gains thermal energy.

The kinetic energy of its particles increases, so its temperature increases and the attraction forces between the particles decreases, and at the boiling point it converts into gaseous state.

2 Ice gains more thermal energy during its melting process.

The kinetic energy of its particles increases, so its temperature increases, and the attraction forces between its particles decreases, and at the melting point (0°C), ice converts into water, and the temperature remains constant for ice and water till complete melting.

3 The atmospheric pressure affecting pure water decreases to below the normal atmospheric pressure.

The boiling point of water decreases below 100°C , and the melting point of ice (freezing point of water) increases above 0°C .

4 The temperature of water vapour in the air decreases to below 0°C

Results in its condensation in the form of fog, dew and clouds.

5 A piece of ice is left in the air for a period of time.

Ice melts and converts into water as a result of gaining thermal energy from the surrounding medium.

6 Leaving dry ice in the air.

Dry ice sublimates when it absorbs thermal energy from the surrounding medium.

7 Heating solid iodine.

Solid iodine sublimates to iodine vapour when it is heated.

8 A concentrated spray of regular coffee is exposed to extremely hot dry air.

The evaporation rate increases due to increasing the surface area of the spray droplets exposed to the hot air.

Give reason ?

1 During melting and boiling processes, the temperature remains constant, despite the continued heating.

Because the absorbed thermal energy is used to weaken the attraction forces between the particles of the substance.

2 The purity of substances can be verified by comparing their melting or boiling points with their fixed values in their pure state.

Because the presence of impurities affects the attraction forces between the particles of the pure substance, which leads to a change in the amount of energy needed to change its state, and consequently changes its melting and boiling points.

3 The boiling point of pure water is less than 100°C at mountain peaks.

Because as altitude increases above sea level, atmospheric pressure decreases, and the temperature decreases by 1°C for every 300 m of altitude, so the boiling point of water decreases to below 100°C

4 Fuel consumption decreases when cooking by using a pressure cooker.

Because trapping steam inside it during cooking increases the pressure, which raises the boiling point of water above 100°C , which reduces the cooking time and saves fuel.

5 The boiling point of a glucose solution is higher than that of distilled water.

Because the presence of glucose in water affects the attraction forces between water particles, resulting in an increase in the amount of energy needed for water to change from a liquid state to a gaseous state, thus raising its boiling point.

6 Formation of water droplets on the outer surface of a cup containing iced water.

Because the water vapour in the air condenses into water droplets on the outer surface of the iced water cup as a result of losing thermal energy.

7 Matter conversions from one state to another are reversible processes.

Because they are physical changes that are not accompanied by a change in the composition of their molecules or the formation of new substances, and they can return back to their original state, as in melting and freezing processes, as well as evaporation and condensation processes.

8 Evaporation process takes a longer time than boiling process.

Because evaporation process occurs to the molecules on the surface of the liquid at any temperature less than its boiling point, while boiling process occurs to all molecules in the liquid at a certain point known as the boiling point.

9 Wet clothes dry faster in summer than in winter.

Because the higher temperature in summer increases the number of molecules that have sufficient thermal energy from the surrounding medium to escape from the surface of the clothes, allowing them to dry quickly.

10 Evaporation rate increases by increasing the temperature.

Due to increasing of the number of molecules that have sufficient thermal energy from the surrounding medium to escape from the surface of the liquid.

11 Evaporation rate increases by increasing the surface area of the liquid exposed to evaporation.

Due to increasing in the number of molecules that can gain the thermal energy needed from the surrounding medium to be released from the surface of the liquid.

12 Evaporation rate increases when the air currents increases.

Because it increases evaporation of more water molecules from the surface of the liquid.

13 Feeling uncomfortable in hot and humid weather.

Because in hot weather, the secretion of sweat increases to reduce the feeling of heat, but when the humidity percentage is high, the rate of sweat evaporation decreases, causing feeling of discomfort.

Compare between ?

1	Freezing process	Melting process
	The process of changing of matter from a liquid state to a solid state	The process of changing of matter from a solid state to a liquid state
	It occurs by losing thermal energy	It occurs by gaining thermal energy

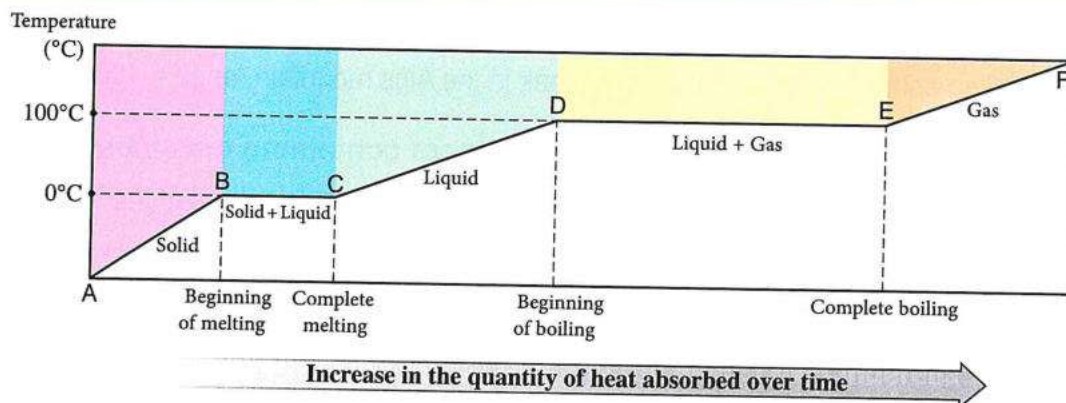
2	Evaporation process	Condensation process
	The process of changing of matter from the liquid state to the gaseous state	The process of changing of matter from the gaseous state to the liquid state
	It occurs by gaining thermal energy	It occurs by losing thermal energy

3	Sublimation process	Deposition process
Definition	The process of change of a substance directly from the solid state to the gaseous state without passing through the liquid state	The process of change of a substance directly from the gaseous state to the solid state without passing through the liquid state
Examples	Dry ice sublimation	Formation of frost on tree branches

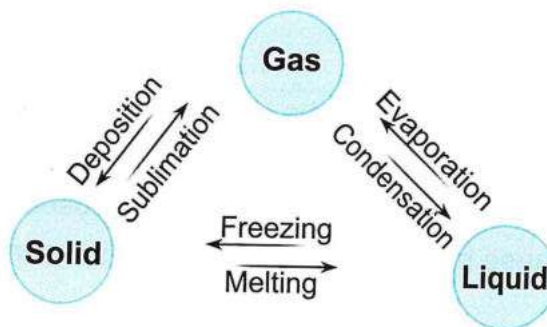
4	Evaporation process	Boiling process
	The process of conversion of matter from the liquid state to the gaseous state at any temperature below its boiling point	The process of conversion of matter from the liquid state to the gaseous state at a certain point, known as the boiling point
	It occurs to the molecules on the surface of the liquid	It occurs to all the liquid molecules
	It occurs by gaining thermal energy from the surrounding medium or from a heat source	It occurs by gaining thermal energy from a heat source
	It takes a relatively long period of time	It takes a relatively short period of time
	It is not accompanied by the formation of air bubbles (gases inside the liquid)	It is accompanied by the formation of air bubbles (gases inside the liquid)

Remember that

1 The heating curve of water in its three fundamental states



2 Changes of matter



Variant questions ?

Q1 The opposite table shows the boiling and melting points of three pure substances (X), (Y), and (Z).

State the physical states of these substances at 100°C, with an explanation.

Substance	(X)	(Y)	(Z)
Boiling point	84°C	125°C	315°C
Melting point	5°C	25°C	102°C

- A** ∴ Substance (X) has a melting point and boiling point less than 100°C
 ∴ Substance (X) is in the gaseous state.
 ∴ Substance (Y) has a melting point less than 100°C and a boiling point higher than 100°C
 ∴ Substance (Y) is in the liquid state.
 ∴ Substance (Z) has a melting point and boiling point greater than 100°C
 ∴ Substance (Z) is in a solid state.

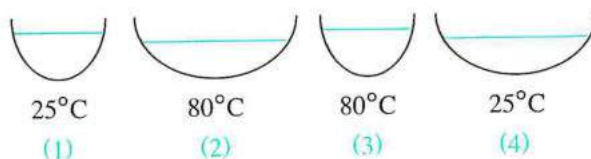
Q2 What is the boiling point of water at the highest peak in the Alps Mountain range, which is approximately 4800 m above sea level?

A ∴ The temperature decreases by 1°C for every 300 m of altitude.

∴ The decrease in temperature = $\frac{4800}{300} = 16^{\circ}\text{C}$

∴ The boiling point of water at the highest peak in the Alps mountain range = $100 - 16 = 84^{\circ}\text{C}$

Q3 The following figures represent four containers containing equal amounts of pure water at different temperatures, which were left in the air for several hours:



State with explanation the number of the container that:

(1) Contains the least amount of water over time.

(2) Has the lowest evaporation rate.

- A** (1) Container (2) / Because it contains the least amount of pure water, the evaporation rate in it is higher, as the evaporation rate increases with rising temperature and by increasing the surface area exposed to evaporation.
- (2) Container (1) / Because both the temperature and the surface area in it are the lowest.

Q4 Each pure substance, has fixed values for its melting and boiling points at normal atmospheric pressure:

(1) State the values of the melting and boiling points of water at normal atmospheric pressure.

(2) Mention some factors that affect the melting and boiling points of substances.

A (1) **Melting point (ice):** 0°C

Boiling point: 100°C

(2) - Atmospheric pressure.

- Purity of the substance.

Q5 Mention the factors affecting the rate of evaporation of liquids.

- A** (1) Temperature.
- (2) Surface area of the liquid exposed to evaporation.
- (3) Humidity percentage.
- (4) Air currents.

Q6 Mention a technological application that depends on the fact that pressure affect boiling point, Explaining how it works and its importance.

A Pressure cooker (steam pot).

*** Idea of work:**

Trapping steam inside it during cooking, which increases the pressure inside it consequently increases the boiling point of water above 100°C , which reduces cooking time and saves fuel.

*** Importance:**

It cooks food in a shorter time compared to normal cooking pots, leading to fuel (energy) saving.

Q7 Mention a technological application based on the fact that the surface area exposed to evaporation affects the rate of evaporation.

A Instant coffee.

Q8 What are the steps involved in manufacturing of instant coffee ?

A (1) A concentrated extract is prepared from regular coffee.

(2) The sprayed concentrated coffee extract is exposed to extremely hot dry air (about 250°C).

(3) Solid instant coffee crystals are collected.

Internal Energy and Temperature

What is meant by ?

The system	Any part of the universe that is under study where the changes in energy and matter are observed.
The surroundings	The space surrounding the system which can exchange energy or matter or both with the system.
The open system	A system in which both energy and matter are exchanged with the surroundings.
The closed system	A system in which only energy is exchanged with the surroundings, but matter is not exchanged.
The isolated system	A system in which neither energy nor matter is exchanged with the surroundings.
The internal energy of the system	The summation of the potential energy and the kinetic energy of the particles of the system.
The temperature of a system	A measure of the average kinetic energy of the particles of the system.
Specific heat	The quantity of heat required to raise the temperature of 1 kg of a substance by 1°C

Give reason ?

- A cup of hot tea represents an open system.**
Because energy and matter are exchanged with the surroundings.
- The pressure cooker represents a closed system, while the thermos represents an isolated system.**
The pressure cooker is a closed system because it only allows for the exchange of heat without the exchange of matter (water vapour) with the atmospheric air, whereas thermos is an isolated system as it neither exchange heat nor matter with the surroundings.
- The temperature of the liquid decreases when it loses a quantity of thermal energy.**
Because when the system (liquid) loses thermal energy, the average kinetic energy of its particles decreases.
- The speed of perfume diffusion in warm air is greater than in cold air.**
Because the average kinetic energy of hot air particles is greater than the average kinetic energy of cold air particles.

- 5 The extent of elevation in the temperature of one substance decreases by increasing its mass when it gains a certain amount of heat.**

Because the thermal energy gained by the substance is distributed among a larger number of particles.

- 6 When heating two equal masses of oil and water from the same heat source, the elevation of the temperature of the oil is greater than that of water.**

Because the specific heat of oil is lower than that of water.

- 7 The specific heat is a characteristic property of a substance.**

Because it varies according to the type of substance and it is a constant value for each substance.

- 8 Water is an excellent cooling liquid.**

Due to its high specific heat, it absorbs large quantities of thermal energy without a significant increase in its temperature.

- 9 Mercury is used in thermometers.**

Because the specific heat of mercury is low and its temperature rises quickly when it absorbs any amount of heat.

- 10 The human body contains a large percentage of water.**

Because the specific heat of water is high, so it maintains a constant body temperature when the temperature of the surroundings changes.

- 11 The potential energy of solid substances is maximum, while the potential energy of gaseous substances is almost zero.**

Because the forces of attraction between the particles of solid substances are very strong and the interparticle spaces between them are very small, whereas the forces of attraction between the particles of gaseous substances are very weak and the interparticle spaces between them are very large.

What happens when ?

- 1 The system gains thermal energy from the surroundings.**

The average kinetic energy of its particles increases, resulting in a rise in the temperature of the system.

- 2 Heating two different masses of distilled water separately at the same temperature for an equal period of time using a steady flame.**

The temperature of the smaller mass increases by a greater extent.

- 3 Heating two equal masses of water and oil separately to the same temperature for an equal period of time using a steady flame.

The temperature of oil rises more than that of water.

- 4 Heating two equal masses of water and ice separately for an equal period of time using a steady flame.

The temperature of ice rises more than the temperature of water.

Compare between ?

1	The open system	The closed system	The isolated system
Definition	A system in which both energy and matter are exchanged with the surroundings	A system in which only energy is exchanged but the matter is not exchanged with the surroundings	A system in which neither energy nor matter is exchanged with the surroundings
Example	An open container with boiling water	A can of soft drink placed in ice	Thermos contain a hot drink

2	Solid substances	Liquid substances	Gaseous substances
Potential energy	Maximum	Medium	Almost zero
Kinetic energy	Small	Medium	Very high

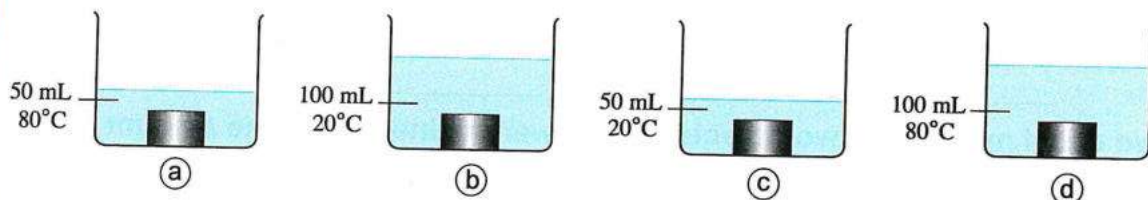
Mathematical relationships ?

- Internal energy of the system = Potential energy of the particles + Kinetic energy of the particles
- Average kinetic energy of the system's particles

$$= \frac{\text{Total kinetic energy of the particles}}{\text{Number of particles}}$$

Study the following figures, then answer ?

The following figures show four beakers containing amounts of water, different in both quantity and temperature. Four metallic blocks of equal masses and temperature (80°C), were placed in them :



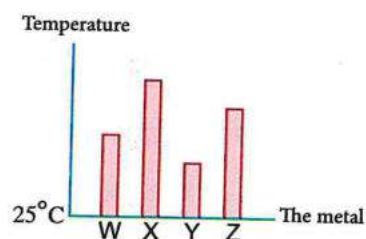
In which of these beakers, the temperature of the water is greater?

Explain your answer.

Answer _____

Beaker (c) / Because it has the least volume (mass) of water and the least temperature.

Four rods of different metals, all have the same mass, were heated with the same heat source for the same period of time and temperature increased as shown in the opposite figure.



What is the correct descending order of the specific heat of these metals? Explain.

Answer _____

$Y > W > Z > X$

Because the lower the specific heat of a substance, the more rapidly its temperature increases when it absorbs a small amount of thermal energy.

Variant Questions ?

Q1 What is the system whose mass changes over time? Explain.

A The open system, as it exchanges matter with the surroundings.

Q2 What is meant by the specific heat of iron is $450 \text{ J/kg} \cdot ^{\circ}\text{C}$?

A The amount of heat required to raise the temperature of 1 kg of iron by 1°C is equal to 450 J

Q3 Which is thermally preferred in the manufacture of heating pots : copper or aluminum ? With explanation.

A Copper / Because its specific heat is lower than that of aluminum, so the temperature of copper increases faster when it gains a small amount of thermal energy.

Q4 Two equal masses of two objects (X), (Y) were gained the same amount of heat, so the temperature of object (X) increased by an amount less than that of object (Y).

What is the scientific explanation for this observation ?

A The two objects are made of different substances, and the specific heat of object (X) is greater than that of object (Y).

Q5 The opposite table shows the specific heat values of different metals, each with the same initial temperature and a mass of 70 g

Metal	Specific heat (J/kg.°C)
(X)	0.133
(Y)	0.528
(Z)	0.388

Which of these three metals its temperature increases to a great extent when heated by the same heat source for the same period of time? with giving reason.

A The temperature of metal (X) increases more significantly, because its specific heat is the lowest.

Q6 Mention a life application that proves that water is an excellent cooling liquid.

A The use of water in the radiator used for cooling car engines.

Q7 Identify the factors that affect the change in temperature of objects.

A

- Mass of matter.
- Type of matter.
- State of matter.

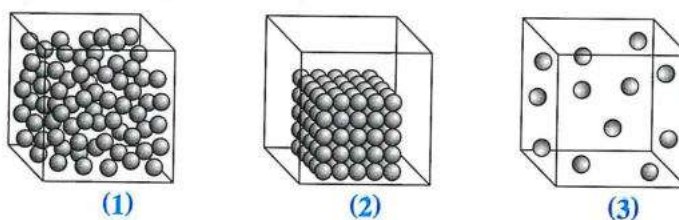
1 [A] Choose the correct answer :

2 Marks

- (1) Liquid substances have
- a fixed volume and a fixed shape.
 - a fixed volume and indefinite shape.
 - indefinite volume and a fixed shape.
 - indefinite volume and shape.
- (2) Which of the following describes gas particles?
- The interparticle spaces between them are small.
 - They are incompressible.
 - The attraction forces between them are very weak.
 - They move in a limited motion.

[B] The following figures represent the three main states of matter:

3 Marks



(1) Which physical state is represented by each of the three figures?

(2) What type of motion does matter (2) exhibit?

(3) In which of these three states is the movement of pollen grains the fastest? Explain.

2 [A] Mark (✓) or (X) for each of the following statements:

2 Marks

- The particles of a liquid are in a state of continuous motion. ()
- The difference in the properties of a substance leads to variations in the forces of attraction between its molecules. ()

[B] Give reasons for the following:

3 Marks

- Oil and oxygen are fluids.
- The dissolution of table sugar in water.
- Solids have definite shape and volume.

3 [A] Write the scientific term of each of the following:

2 Marks

- (1) Everything that has mass and occupies space. (.....)
- (2) The random motion of relatively large particles suspended in a fluid, as a result of their collisions with it. (.....)

[B] Compare between each of the following:

3 Marks

- (1) Air and water (In terms of compressibility).
.....
- (2) Gases and plasma (In terms of charge).
.....
- (3) Gas (A) and gas (B) have a molecular mass ratio of 1:18 (In terms of diffusion rate).
.....

Test UNIT 1

Lesson Two | Changes in the States of Matter

15 Marks

1 [A] Complete the following statements :

2 Marks

- (1) During and processes, the substance gains thermal energy, but its temperature remains constant.
- (2) The changing of a substance directly from the gaseous state to the solid state is known as, as in the formation of

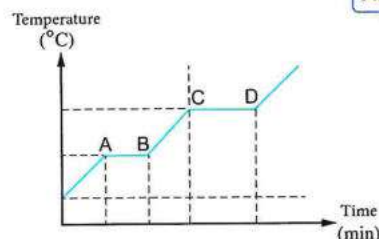
[B] The opposite graph shows the heating curve of water under certain conditions:

3 Marks

- (1) What is meant by the melting of ice?
Which part does it represent on the graph?

- (2) What is the temperature at point (D)?

- (3) Do the temperature values shown on the graph change when measured at higher altitudes? Explain.



2 [A] Correct the underlined words:

2 Marks

- (1) The changing of a substance from a solid state to a gaseous state directly is known as deposition. (.....)
- (2) Increasing the surface area of the liquid exposed to air increases the rate of the boiling process. (.....)

[B] What is the difference between each of the following:

3 Marks

(1) Normal ice **and** dry ice.

(2) Boiling **and** evaporation.

(3) Instant coffee **and** regular coffee.

3 [A] Choose the correct answer:

2 Marks

(1) When dissolving 180 g of glucose in 1 L of distilled water, the solution

(a) freezes at 0°C

(b) boils at 100°C

(c) freezes at 1.86°C

(d) boils at 100.5°C

(2) Among the reversible processes are

(a) melting and boiling.

(b) boiling and evaporation.

(c) melting and freezing.

(d) freezing and condensation.

[B] Explain the relation between each of the following:

3 Marks

(1) Rate of evaporation **and** humidity.

(2) Purity of the substance **and** its melting point.

(3) Kinetic energy of the particles of the substance **and** temperature.

Test UNIT 1

Lesson Three | Internal Energy and Temperature

15 Marks

1 [A] Write the scientific term of each of the following:

2 Marks

(1) The system in which there is an exchange of energy and matter with the surroundings. (.....)

(2) The amount of heat required to raise the temperature of 1 kg of a substance by 1°C (.....)

[B] The radiator is a fundamental system in all vehicles (cars):

3 Marks

(1) **What** is the importance of the radiator in vehicles?

(2) What is the liquid used in the radiator? And why?

(3) What happens to the temperature upon heating equal masses of radiator liquid and cooking oil by using the same heat source for 2 minutes?

2 [A] Choose the correct answer:

2 Marks

(1) When a quantity of water is heated, each of the following increases, except

- (a) the number of molecules.
- (b) the temperature.
- (c) the kinetic energy of the molecules.
- (d) the internal energy of the molecules.

(2) An experiment was conducted by heating two equal masses of water and ice, where the same heat source is used.

Which of the following represents the dependent variable?

- (a) The equality of the two masses.
- (b) The difference in the type of the two substances.
- (c) The difference in the change in temperature of the two masses.
- (d) The equality of the amount of heat gained.

[B] Several factors affect the amount of the change in temperature in a system when it loses a quantity of heat:

3 Marks

(1) Mention three of these factors.

(2) How can the system loss of a quantity of heat be indicated?

(3) Which substance gains heat more quickly, copper or aluminum? Explain.

3 [A] Complete the following statements:

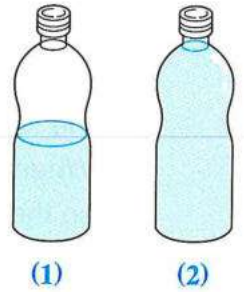
2 Marks

(1) The internal energy of the system is equal to the summation of and of all its particles.

(2) The liquid is used in the manufacture of thermometers and the liquid represents a large percentage of the human body's composition.

[B] The opposite figure illustrates two plastic bottles containing unequal quantities of the same liquid at the same temperature:

3 Marks



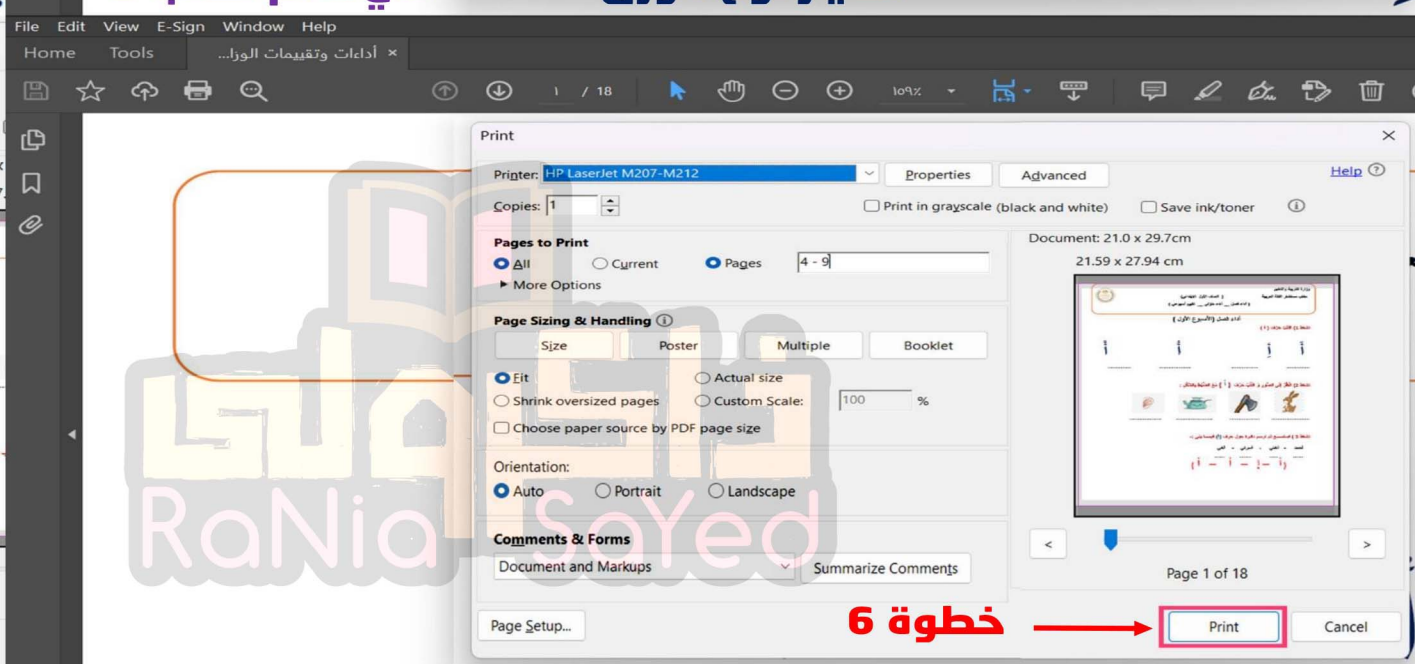
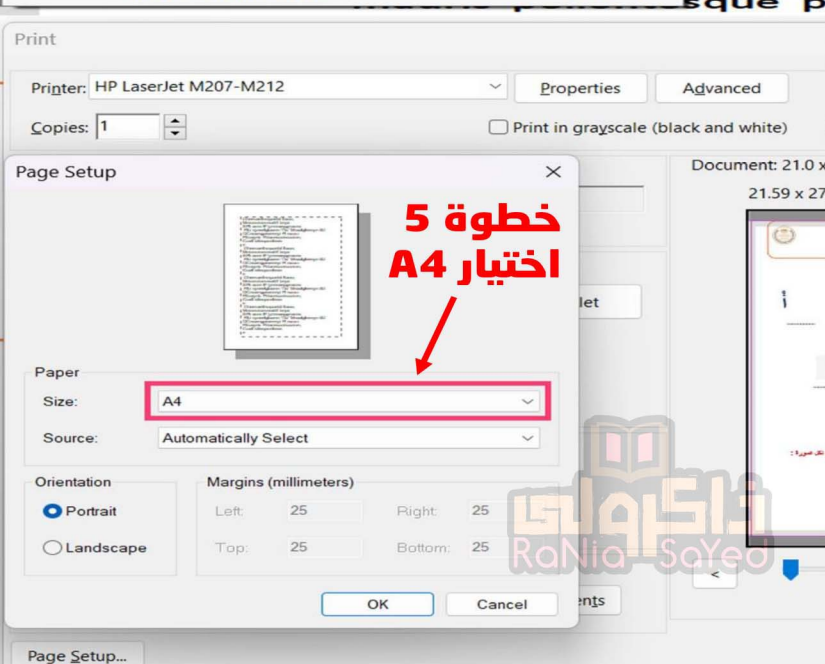
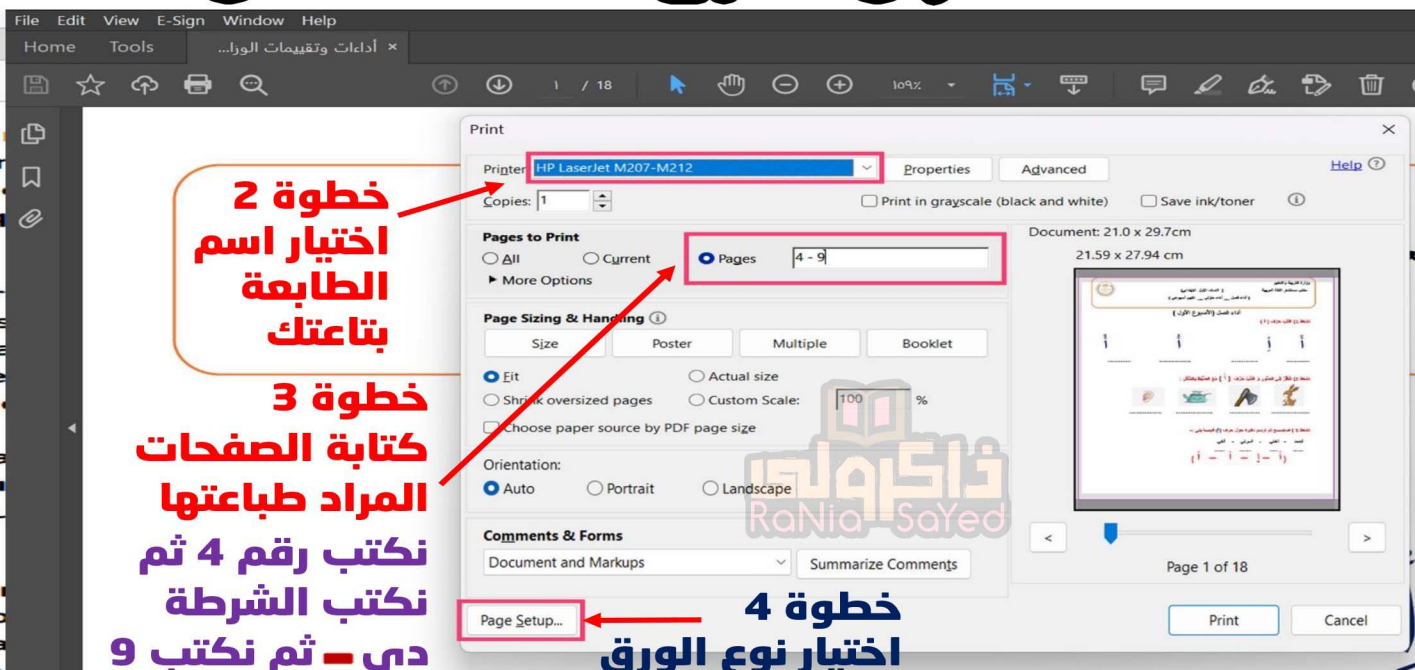
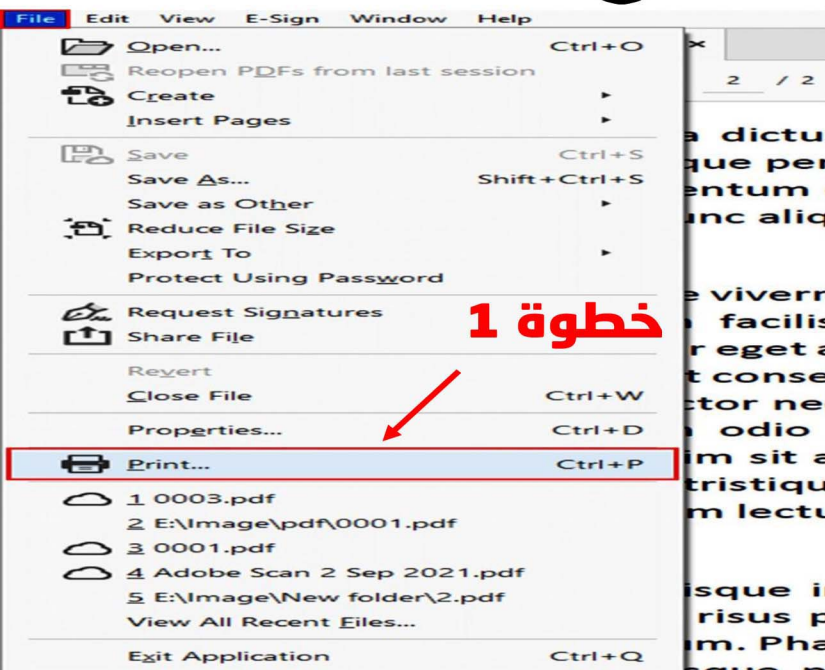
(1) **What** is the type of the system that bottle (1) represents? **With explanation.**

(2) **Does** the internal energy of the liquid molecules in the two bottles differ? **With explanation.**

(3) **Which** of the two bottles its temperature increases by 2°C faster when exposed to sunlight? **With explanation.**

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

اختبار شهر اكتوبر



1- A) Choose the correct answer:

- The attraction force between ice particles before melting is the attraction force between them after melting.

a) less than b) greater than c) equal to d) weaker than

B) Give a reason for:

- ① The color of potassium permanganate spreads faster in hot water than in cold water.

•

- ② The boiling point of water at the top of a mountain is different from its boiling point at sea level.

•

- ③ Liquids and gases are called fluids.

•

2- A) Complete the following sentence:

- The internal energy of a system = + of all particles in the system.

B) What is meant by ...?

- ① Sublimation process

•

- ② Temperature

•

3- A) Write the scientific term:

- Substances that can flow and take the shape of the container that holds them.

(.....)

B) What happens when ...?

- ① The temperature of the medium increases "in terms of the rate of diffusion of the particles through it"

•

- ② The humidity of the air increases near a water surface "in terms of the rate of evaporation"

•

1- A) Put (✓) or (X):

- The boiling point of water is 100 degree Celsius. ()

B) First: Give a reason for:

- 1 The internal energy of a system increases when it gains heat energy.

•

Second: Mention the factors that the diffusion rate depends on.

•

2- A) Choose the correct answer:

- Loss of heat energy occurs during

- | | |
|----------------------------|-------------------------|
| a) evaporation of seawater | b) melting of polar ice |
| c) water freezing | d) boiling of water |

B) First: Compare between each of the following:

- 1 Solids and gases "in terms of interparticle spaces and attraction forces"

.....

- 2 Open system and closed system "in terms of the exchange of energy and matter with surroundings"

Open system	Closed system
.....	
.....	

Second: What are the factors affecting the rate of evaporation of liquids?

•

3- A) Complete the following sentence:

- The particles of matter move from an area of concentration to an area of concentration.

B) What happens when ...?

- 1 The temperature of water vapour in the air decreases below zero degrees Celsius.

•

- 2 Gases pass through a high electric field

•

1- A) Complete the following sentence:

- matter can flow and be compressed, while matter can only flow.

B) First: What happens when ...?

- 1 The solid substance gains thermal energy

•

Second: What is meant by ...?

- 1 Brownian motion

•

- 2 Deposition process

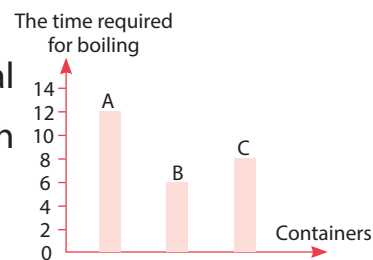
•

2- A) Put (✓) or (X):

- A closed bottle of soft drink placed in ice is considered an isolated system. ()

B) Look at opposite figure, then answer:

Three different amounts of water were heated in three identical containers, and the opposite graph shows the time that each amount took to reach the boiling point.



- 1 Which of these containers contains the smallest amount of water?
•
- 2 What is the independent variable and what is the controlled variable in this experiment?
•

3- A) Choose the correct answer:

- Which of the following properties is used to distinguish between gases and liquids?
a) Mass b) Compressibility c) Shape d) Color

B) Answer the following questions:

- 1 What is the relationship between the viscosity of a liquid and its flow rate?

•

- 2 What happens if the dry ice is left in air.

•

1- A) Put (✓) or (X):

- Liquids can be compressed and can flow because they have weak attraction forces between its particles. ()

B) Answer the following questions:

- 1 Cross out the odd word, then mention the relation between the left words:

compressible - indefinite shape - can't flow - indefinite volume

•

- 2 What is meant by ...? - Fluidity

•

- 3 Why does salt dissolve faster in hot water than in cold water?

•

2- A) Complete the following sentence:

- When the surface area of a liquid exposed to air increases, the rate of evaporation

B) Give a reason for:

- 1 The boiling point is a characteristic property of pure substances, unlike evaporation.

•

- 2 A soft drink metal can is considered a closed system.

•

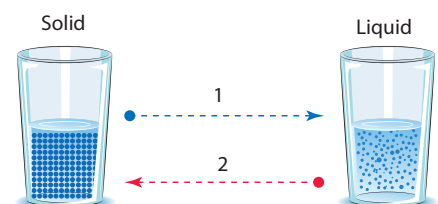
3- A) Write the scientific term:

- It separates the system from its surroundings. (.....)

B) Look at the opposite figure, then answer:

- 1 During process no. 1 , the interparticle spaces between solid particles and they will move

- 2 Process no. 2 is called



1- A) Choose the correct answer:

- When a substance gains heat, its particles
 - a) come closer b) move slower c) move faster d) stay still

B) Give a reason for:

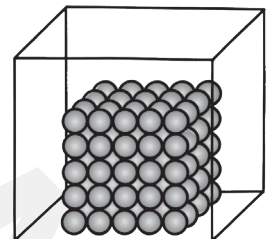
- 1 Solids have definite shape and volume.
 -
- 2 Plasma is used in air-conditioning systems.
 -
- 3 The boiling point of pure water becomes less than 100°C as we go up above sea level.
 -

2- A) Complete the following sentence:

- A medical thermometer is an example of a, while a teapot is an example of an

B) Look at the opposite figure, then answer:

- 1 What is the state of the opposite matter?
 -
- 2 Is it a fluid? And why?
 -



3- A) Put (✓) or (X):

- Using a pressure cooker in cooking reduces cooking time and saves fuel. ()

(B) What happens when ...?

- 1 The liquid substance gain energy
 -
- 2 The system gains thermal energy from the surroundings
 -

1- A) Choose the correct answer:

- The attraction force between ice particles before melting is the attraction force between them after melting.

a) less than b) greater than c) equal to d) weaker than

B) Give a reason for:

- 1 The color of potassium permanganate spreads faster in hot water than in cold water.
 - Because when temperature increases, the kinetic energy of the particles increases, so their ability to diffuse also increases.
- 2 The boiling point of water at the top of a mountain is different from its boiling point at sea level.
 - Because as we go higher, the atmospheric pressure decreases, so the boiling point decreases.
- 3 Liquids and gases are called fluids.
 - Because both have the ability to flow.

2- A) Complete the following sentence:

- The internal energy of a system = potential energy + kinetic energy of all particles in the system.

B) What is meant by ...?

- 1 Sublimation process
 - It is the process in which a substance changes from the solid state directly into the gaseous state without passing through the liquid state.
- 2 Temperature
 - It is a measure of the average kinetic energy of the particles.

3- A) Write the scientific term:

- Substances that can flow and take the shape of the container that holds them.
(Fluids)

B) What happens when ...?

- 1 The temperature of the medium increases "in terms of the rate of diffusion of the particles through it"
 - The diffusion rate of the particles increases.
- 2 The humidity of the air increases near a water surface "in terms of the rate of evaporation"
 - The rate of evaporation decreases.

1- A) Put (✓) or (X):

- The boiling point of water is 100 degree Celsius.

(✓)

B) First: Give a reason for:

- 1 The internal energy of a system increases when it gains heat energy.

- Because the kinetic energy of the system's particles increases.

Second: Mention the factors that the diffusion rate depends on.

- 1- the temperature of the medium.
- 2- the mass of the particles.

2- A) Choose the correct answer:

- Loss of heat energy occurs during

a) evaporation of seawater

b) melting of polar ice

c) water freezing

d) boiling of water

B) First: Compare between each of the following:

- 1 Solids and gases "in terms of interparticle spaces and attraction forces"

Points of comparison	Solids	Gases
Interparticle spaces	Very small	Very large
Attraction forces	Very strong	Very weak

- 2 Open system and closed system "in terms of the exchange of energy and matter with surroundings"

Open system	Closed system
It allows the exchange of both energy and matter with surroundings.	It allows the exchange of energy but doesn't allow the exchange of matter with surroundings.

Second: What are the factors affecting the rate of evaporation of liquids?

1- Temperature

2- Surface area of the liquid

3- Humidity percentage

4- Air currents

3- A) Complete the following sentence:

- The particles of matter move from an area of **higher** concentration to an area of **lower** concentration.

B) What happens when ...?

- 1 The temperature of water vapour in the air decreases below zero degrees Celsius.

- Frost forms on the surfaces of crops and cars.

- 2 Gases pass through a high electric field

- Their atoms convert into positively charged ions and negatively charged electrons.

1- A) Complete the following sentence:

- **Gaseous** matter can flow and be compressed, while **liquid** matter can only flow.

B) First: What happens when ...?

- 1 The solid substance gains thermal energy
 - The attraction forces between its particles become weak, their kinetic energy increases and the temperature rises to its melting point.

Second: What is meant by ...?

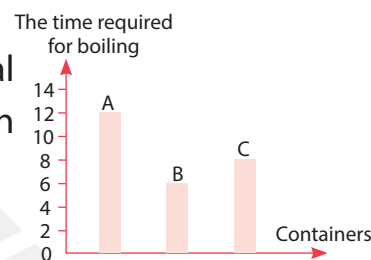
- 1 Brownian motion
 - It is the random motion of large particles suspended in a fluid occurs due to the collision between the molecules of fluids and these particles.
- 2 Deposition process
 - It is the change of a substance directly from the gaseous state to the solid state without passing through the liquid state.

2- A) Put (✓) or (X):

- A closed bottle of soft drink placed in ice is considered an isolated system. (X)

B) Look at opposite figure, then answer:

Three different amounts of water were heated in three identical containers, and the opposite graph shows the time that each amount took to reach the boiling point.



- 1 Which of these containers contains the smallest amount of water? ● **Container (B) as it takes the shortest time to evaporate**
- 2 What is the independent variable and what is the controlled variable in this experiment?
 - **Independent variable: mass of the substance / Controlled variable: type of substance "water"**

3- A) Choose the correct answer:

- Which of the following properties is used to distinguish between gases and liquids?
 - a) Mass
 - b) **Compressibility**
 - c) Shape
 - d) Color

B) Answer the following questions:

- 1 What is the relationship between the viscosity of a liquid and its flow rate?
 - **Liquids with high viscosity have low ability to flow, while liquids with low viscosity flow more easily and faster.**
- 2 What happens if the dry ice is left in air.
 - **It changes directly from a solid to a gas without becoming a liquid.**

1- A) Put (✓) or (X):

- Liquids can be compressed and can flow because they have weak attraction forces between its particles. (X)

B) Answer the following questions:

- 1 Cross out the odd word, then mention the relation between the left words:
compressible - indefinite shape - can't flow - indefinite volume

• (can't flow) (properties of gas)

- 2 What is meant by ...? - Fluidity

• It is the ability of a substance to flow easily.

- 3 Why does salt dissolve faster in hot water than in cold water?

• Because as temperature increases, particle motion increases, and the interparticle spaces between particles increase, helping faster dissolution.

2- A) Complete the following sentence:

- When the surface area of a liquid exposed to air increases, the rate of evaporation increases.

B) Give a reason for:

- 1 The boiling point is a characteristic property of pure substances, unlike evaporation.

• Because boiling occurs at a fixed temperature for each pure substance, while evaporation can occur at any temperature.

- 2 A soft drink metal can is considered a closed system.

• Because it allows the transfer of energy (heat) but does not allow the transfer of matter in or out of the can.

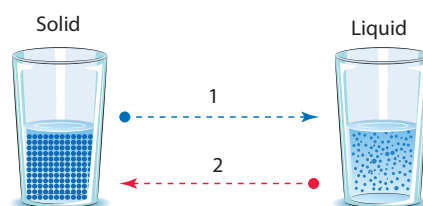
3- A) Write the scientific term:

- It separates the system from its surroundings.

(Boundary)

B) Look at the opposite figure, then answer:

- 1 During process no. 1, the interparticle spaces between solid particles increase and they will move faster.
- 2 Process no. 2 is called freezing.



1- A) Choose the correct answer:

- When a substance gains heat, its particles
 a) come closer b) move slower c) move faster d) stay still

B) Give a reason for:

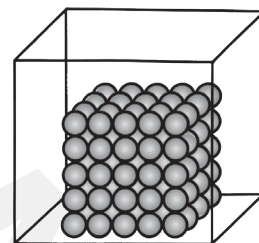
- 1 Solids have definite shape and volume.
 - Because the attraction forces between their particles are very strong the particles are tightly packed and cannot move from their positions.
- 2 Plasma is used in air-conditioning systems.
 - To improve air quality in enclosed spaces.
- 3 The boiling point of pure water becomes less than 100°C as we go up above sea level.
 - Because atmospheric pressure decreases as altitude increases, causing water to boil at a lower temperature.

2- A) Complete the following sentence:

- A medical thermometer is an example of a **closed system**, while a teapot is an example of an **open system**.

B) Look at the opposite figure, then answer:

- 1 What is the state of the opposite matter?
 Solid state.
- 2 Is it a fluid? And why?
 No, because it has a fixed shape and cannot flow.



3- A) Put (✓) or (X):

- Using a pressure cooker in cooking reduces cooking time and saves fuel. (✓)

(B) What happens when ...?

- 1 The liquid substance gain energy
 - The particles move faster and the substance may change into a gas.
- 2 The system gains thermal energy from the surroundings
 - Heat is transferred to the system, its internal energy increases, and its temperature rises.

حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

اختبار شهر اكتوبر



1**Write down what the following sentences mean:****Lesson 1**

- 1- Everything that has mass and volume.
- 2- A state of matter that has a definite shape and fixed volume.
- 3- A state of matter that has the ability to spread and be compressed.
- 4- The state of matter that has a fixed volume and varies in shape with the container that contains it.
- 5- A theory that explains the behavior and properties of matter.
- 6- The movement of particles of matter in fluids is random in all directions.
- 7- A state of matter that occurs when gases are ionized into positively and negatively charged ions.

Lesson 2

- 8- The change of matter from the solid state to the gaseous state directly
- 9- The change of matter from the gaseous state to the solid state directly
- 10- Coffee dissolves in water faster than regular coffee
- 11- A pot cooks food faster because it traps steam inside
- 12- The temperature at which matter changes from a solid to a liquid state.
- 13- The transformation of matter from a solid state to a liquid state by raising the temperature
- 14- The transformation of matter from a gaseous state to a liquid state by lowering the temperature

Lesson 3

- 15- The amount of heat required to raise the temperature of 1 kilogram of matter by 1 °C.
- 16- A system in which there is no exchange of energy and matter with the surrounding medium
- 17- A liquid used in cooling due to its high specific heat value.

- 18- Any part of the universe that is subject to study and observation of changes in energy and matter
- 19- It is considered a measure of the average kinetic energy of the particles in the system.
- 20- A system in which there is an exchange of matter and energy with the surrounding environment.
- 21- A system in which there is an exchange of energy without matter with the surrounding environment.

2**Choose the correct answer:****Lesson 1**

1- Air and water are similar in that they both

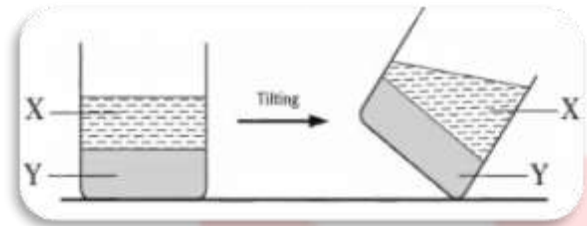
- (A) have mass. (B) can be seen.
(C) have a fixed shape. (D) have a fixed volume.

2- You have two groups of substances, which are: Group (X), Oil, wood and marble. Group (Y), Oxygen, nitrogen and hydrogen.

Which of the following represents one of the properties of groups (X) and (Y)?

Choices	Group (X)	Group (Y)
(A)	Occupy space	Do not occupy space
(B)	Have fixed shape	Do not have fixed shape
(C)	Have fixed volume	Do not have fixed volume
(D)	Can be compressed	Can not be compressed

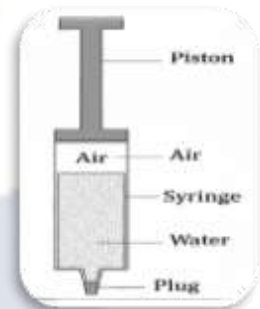
3- When a container containing two substances (X) and (Y) is tilted, their positions become as in the opposite: which of the following determines the state of substances (X) and (Y)?



- (A) (X): Solid, (Y): Liquid.
- (B) (X): Liquid, (Y): Liquid.
- (C) (X): Liquid, (Y): Solid.
- (D) (X): Solid, (Y): Gas.

4- In the opposite figure: What happens to the volume of each of water and air respectively when the piston of the syringe is pressed?

- (A) Decreases, decreases.
- (B) Remains unchanged, increases.
- (C) Remains unchanged, decreases.
- (D) Increases, decreases.



5- Which of the following materials are fluids?

- (A) Ice and liquid water.
- (B) Iron and water vapour.
- (C) Oil and iron.
- (D) Water vapour and liquid water.

6- Which of the following has a definite shape?

- (A) Air.
- (B) Oil.
- (C) Ice.
- (D) Water.

7- Solid matter is characterized by having

- (A) indefinite volume and shape.
- (B) a definite volume and shape.
- (C) a definite shape and indefinite volume.
- (D) a definite volume and indefinite shape.

8- The common property of solids and liquids is that they both

- (A) have a definite volume. (B) have fluidity property.
(C) have a definite shape. (D) can be compressed.

9- Compression of matter means to

- (A) convert it from one state to another. (B) change its mass.
(C) reduce its volume. (D) change the volume of its molecules.

10- The particles of a matter can not be seen with the naked eye, because they

- (A) are very small. (B) vibrate.
(C) move freely. (D) move randomly.

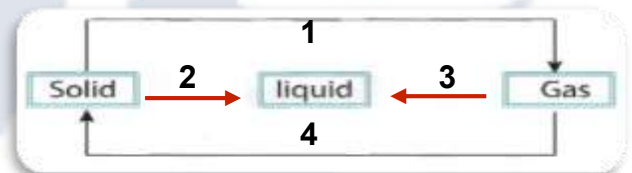
11- It is difficult to bend an iron rod because of

- (A) its compressibility.
(B) its fluidity.
(C) the absence of the interparticle spaces between its molecules.
(D) the strong attraction forces between its molecules.

Lesson 2

12- In the opposite chart:

Which of the following represents the process of sublimation?



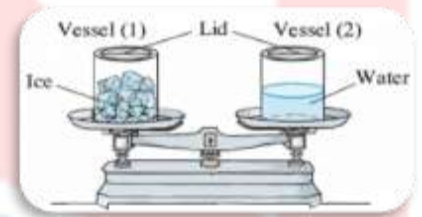
- (A) (1) (B) (2) (C) (3) (D) (4)

13- The same change in physical state occurs in the processes of

- (A) boiling and condensation. (B) boiling and evaporation.
(C) freezing and condensation. (D) freezing and evaporation.

14- The experiment shown in the opposite figure was conducted:

The two pans of the balance were equal at the beginning of the experiment,
After several minutes, the pan holding the vessel (1) moved down, because



- (A) the ice cubes in the vessel (1) melted.
- (B) the water in the vessel (2) evaporated.
- (C) condensation of water vapour inside the vessel (2).
- (D) condensation of water vapour outside the vessel (1).

15- The speed of the matter particles increases during processes.

- (A) condensation and evaporation
- (B) condensation and freezing
- (C) evaporation and melting
- (D) freezing and melting

16- A solid substance, its melting point is 1500°C , changes into its liquid state at

- (A) 1000°C
- (B) 1500°C
- (C) 1550°C
- (D) 2000°C

17- The boiling point of water at the top of a mountain its height equals 3000 m is

- (A) 100°C
- (B) 94°C
- (C) 90°C
- (D) 84°C

18- Frost formation is a process.

- (A) evaporation.
- (B) sublimation
- (C) deposition.
- (D) condensation.

19- Wet clothes dry when exposed to the sun as a result of the process of

- (A) melting.
- (B) evaporation.
- (C) boiling.
- (D) condensation.

20- The rate of evaporation increases by increasing all the following, except

- (A) temperature.
- (B) surface area of liquid exposed to evaporation.
- (C) humidity percentage.
- (D) air currents.

21- In which of the following processes the substance gains heat energy?

- (A) Freezing (B) Condensation (C) Sublimation (D) Deposition

22- When solid dry ice (CO_2) is heated, it turns directly into gas without passing through the liquid state. This process is called...

- (A) Evaporation (B) boiling (C) sublimation (D) melting

Lesson 3

23- The internal energy of water increases when

- (A) the temperature of water changes from 70°C to 60°C
 (B) water vapour condenses on a plant leaf.
 (C) a quantity of water is heated from 20°C to 30°C
 (D) it is placed in a refrigerator.

24- Four equal masses of different metals, (at 25°C), were heated for 10 minutes using the same heat source.

The temperature of each metal is recorded in the opposite table:

Metal	(1)	(2)	(3)	(4)
Temperature after heating	59°C	62°C	55°C	70°C

Which of these metals is best used in the manufacture of cookware that can withstand high temperatures?

- (A) (1) (B) (2) (C) (3) (D) (4)

25- What are the tools used to find the specific heat of a substance?

- (A) Balance and stopwatch. (B) Balance and thermometer.
 (C) Stopwatch and thermometer. (D) Balance, stopwatch and thermometer.

26- The internal energy of the system increases, when

- (A) the potential energy of its particles increases.
 (B) the kinetic energy of its particles decreases.
 (C) both of its potential energy and kinetic energy decrease.
 (D) its particles stop moving.

27- When a substance is heated, its particles,

- (A) average kinetic energy decreases. (B) average kinetic energy increases.
(C) potential energy increases. (D) internal energy decreases.

28- All the following are factors that affect the system's temperature, except

- (A) its mass. (B) the type of its matter.
(C) its shape. (D) its physical state.

29- When equal masses of water and ice are heated over a steady flame, the elevation in the temperature of

- (A) water is the greatest.
(B) ice is the greatest
(C) each of water and ice is the same in both cases.
(D) water is twice as that in the case of ice.

30- The specific heat of a metallic ball depends on

- (A) type of its substance. (B) its mass.
(C) its volume. (D) its radius.

31- Which of the following substances has the highest specific heat?

- (A) Water. (B) Aluminium. (C) Iron. (D) Mercury.

32- The internal energy of any system is

- (A) The potential energy of the particles only
(B) The kinetic energy of the particles only
(C) The sum of kinetic energy and potential energy of the particles
(D) The emitted heat

33- When heating a substance, the kinetic energy of the particles

- (A) Decreases (B) Remains unchanged
(C) Increases (D) Disappears

34- The change in temperature is measured by

- (A) Electric potential (B) Distance meter
(C) Thermometer (D) Barometer

35- A system that does not exchange matter or energy with surrounding medium is

- (A) An open system (B) A closed system
(C) An isolated system (D) A thermal system

36- When the internal energy of a substance increases,

- (A) The temperature decreases (B) The temperature remains the same
(C) The temperature increases (D) The particles stop moving

3

Complete the following sentences:

Lesson 1

1. Substances can be classified according to their physical state to common states, that are solid,, and gases.
2. Fluids are substances that are in a or states
3. The matter is compressed in the state to reduce
4. The forces of attraction between particles of liquid matter are and the interparticle distances are
5. There is a fourth state of matter known as It is found in outer space ,such as and the
6. Plasma is used in air conditioners to purify air by pollutants and germs.
7. is a reverse process of deposition process.
8. The forces of attraction between particles of solid matter are and the interparticle distances are
9. The states of matter vary depending on the between the particles.

Lesson 2

10. The substance changes from one state to another either by or
11. At normal atmospheric pressure, the melting point of snow =, while the boiling point of water
12. The greatest kinetic energy of matter particles is in the state, and the least kinetic energy is in the
13. The interparticle distances are as large as possible in the state due to between particles.
14. From the factors affecting melting and boiling pointsand
15. The speed of drying clothes can be increased by or
16. Pure water boils at a temperature ofand as atmospheric pressure increases, the boiling point of water 100 °C, while its freezing point 0 °C.
17. As we rise up above the surface of the Earth, atmospheric pressureand boiling point of water becomes than 100 °C.
18. Pressure cookers rate of cooking food by trapping and increasing pressure, causing water to boil at a higher temperature than in regular pots
19. The process is the reverse of process and freezing process is the reverse of the of process
20. As we go up, atmospheric pressure and boiling point of water than 100° C.
21. change of matter is not accompanied by the formation of new substances, whereas change produces a new substance.
22. The greatest kinetic energy of matter particles is in the state and the least kinetic energy is in the state
23. During and processes the temperature of the material remains constant.

Lesson 3

24. The system exchanges energy and matter with the surrounding medium
25. The system does not exchange energy or matter with the surrounding medium
26. The system exchanges energy but not matter with the surrounding medium
27. is the sum of the kinetic energy and potential energy of all particles of the system.
28. represents the degree of hotness or coldness of the system.
29. A system is any part of the that is under study, where changes in and are observed.
30. The systems are divided into , and systems.
31. Change in refers to transfer energy from or to the system

4

correct the underlined words:

Lesson 1

- 1- The flow of liquids differs according to their density.
- 2- During the fluidity, the volume of gas does not change, while the volume of solid changes.
- 3- Liquids do not have a definite shape or volume.
- 4- Solids have the ability to flow but not to be compressed.
- 5- The speed of diffusion through solids is equal to the speed of diffusion through gases.
- 6- The interparticle spaces between liquid molecules are equal to the interparticle spaces between gas molecules.
- 7- Particles suspended in solids move randomly in a phenomenon known as Brownian motion.

Lesson 3

- 8- Cans of soft drinks represent isolated systems.
- 9- Heat is a measure of the average kinetic energy of matter's particles.
- 10- A decrease in the average speed of the particles of a matter leads to a stability in their temperature.
- 11- Mercury is an excellent cooling liquid.
- 12- The specific heat of ice is equal to the specific heat of liquid water.
- 13- The radiator is used to protect car tires from damage.

5

Mark (✓) or (X) for each statement, with correction:

Lesson 1

- 1- Solids and liquids are called fluids. ()
- 2- The ability of a fluid to flow increases with the increase of the viscosity.
()
- 3- The speed of diffusion increases with raising the temperature of the diffusion medium. ()
- 4- The interparticle spaces between particles of matter vary depending on its physical state. ()
- 5- The particles of any matter are in a state of continuous motion. ()
- 6- Attraction forces between particles of solids are almost non-existent. ()
- 7- The movement of gas particles is limited. ()
- 8- The substances that form the Sun and stars exist in the gaseous state. ()

Lesson 2

- 9- Pure water boils at 0°C at normal atmospheric pressure. ()
- 10- The matter changes from one state to another by gaining thermal energy.
()
- 11- During melting and boiling processes, the temperature remains constant.
()
- 12- The temperature decreases by approximately 1°C for every 10 m of altitude. ()

- 13- Cooking food takes a shorter time in a pressure cooker compared to cooking in a normal cooking pot. ()
- 14- Each pure substance has a specific boiling point. ()
- 15- Water freezes in polar regions as a result of gaining thermal energy. ()
- 16- Dry ice is nitrogen in its solid state. ()
- 17- The rate of evaporation increases when the air currents above the surface of a liquid increases. ()
- 18- Increasing the humidity percentage leads to increasing the rate of evaporation. ()
-
- Lesson 3**
- 19- An open system only exchanges matter with the surroundings. ()
- 20- The thermos flask represents a closed system. ()
- 21- The temperature of a substance is a measure of the average kinetic energy of its particles. ()
- 22- An increase in the average kinetic energy of the system's particles, leads to an elevation in its temperature. ()
- 23- The average kinetic energy of hot water particles is equal to the average kinetic energy of cold water particles. ()
- 24- The average kinetic energy of the system's particles is equal to the kinetic energy of one particle, assuming that the kinetic energies of all particles are equal. ()
- 25- Heat transfer from or to an object is indicated by changing its temperature. ()
- 26- The amount of change in the temperature of an object increases as its mass increases when it gains an amount of heat. ()
- 27- The specific heat of a single substance varies according to its physical state. ()
-

6

Choose the odd word (or phrase) out, then mention the relation between the rest:

- 1- Oil/Alcohol / Water / Carbon dioxide.
- 2- Oxygen/Hydrogen / Ammonia /Wood.
- 3- Able to flow / Compressible / Diffusion through it is slow / Has indefinite shape.
- 4- Has a fixed volume / Able to flow / Incompressible / Has a fixed shape.
- 5- Its particles move in a vibrating motion / The attraction forces between its particles are very strong / The interparticle spaces are the least / cannot diffuse.

7

Give reason for (scientific explanation) for each of the following:

Lesson 1

- 1- Solid matter has a fixed shape and a definite volume.

.....

- 2- Gaseous matter has no fixed shape and no definite volume.

.....

- 3- Liquid matter is flowable.

.....

- 4- Gases are compressible.

.....

- 5- Particles of matter spread faster in gases than in liquids.

.....

- 6- Plasma is used in air conditioners.

.....

- 7- It is difficult to break a piece of rock.

.....

8- The possibility of dissolving a quantity of table salt in water.

9- Spreading of smoke produces from a candle wick in the air.

Lesson 2

10- Feeling uncomfortable in hot, humid weather.

11- Wet clothes dry faster on sunny days than on humid days.

12- The pressure cooker saves fuel.

13- The boiling point of water decreases with increasing altitude above sea level.

14- Water evaporates faster from the pot when the stove temperature is raised.

15- Clothes dry faster in summer than in winter

16- Wet clothes dry faster when exposed to air currents

Lesson 3

17- Mercury is used in the manufacture of thermometers.

18- Water makes up a large proportion of the human body.

19- Copper is preferred for use in the manufacture of heating utensils due to its thermal properties.

20- The temperature of ice rises more than that of water when they both

21- acquire the same amount of thermal energy and their masses are equal.

22- Water is used to cool many systems.

8

what can be observed when (what happen if)

Lesson 1

1- A few crystals of potassium permanganate are added to a beaker containing an amount of water.

2- A spoonful of sugar is stirred in a cup of water.

3- Gases are heated to extremely high temperatures in a research laboratory.

Lesson 2

4- The liquid substance gains thermal energy.

5- Ice gains more thermal energy during its melting process.

6- The atmospheric pressure affecting pure water decreases to below the normal atmospheric pressure.

7- The temperature of water vapour in the air decreases to below 0°C

8- A piece of ice is left in the air for a period of time.

9- Leaving dry ice in the air.

10- Heating solid iodine.

.....

11- A concentrated spray of regular coffee is exposed to extremely hot dry air.

.....

Lesson 3

12- The system gains thermal energy from the surroundings.

.....

13- Heating two different masses of distilled water separately at the same temperature for an equal period of time using a steady flame.

.....

14- Heating two equal masses of water and oil separately to the same temperature for an equal period of time using a steady flame.

.....

15- Heating two equal masses of water and ice separately for an equal period of time using a steady flame.

.....

9

compare between each of the following

Lesson 1

1- Solid matter, liquid matter and gaseous matter «In terms of: Fluidity - Compressibility - Diffusibility»

.....

2- Iron, oil and oxygen «In terms of: Change its shape with the container - Change its volume with compression»

.....

3- Ice, water and water vapour «In terms of: Particles movement - spaces - Attraction forces».

.....

Lesson 2

4- Melting point of ice and boiling point of water.

5- Melting process and freezing process.

6- Evaporation process and condensation process

7- Sublimation process and deposition process, with examples.

8- Evaporation process and boiling process.

Lesson 3

9- Open system, closed system and isolated system (in terms of definition and examples)

10- Solid substance, liquid substance and gaseous substance (in terms of potential energy and kinetic energy)

10 Answer the following:

Lesson 1

1- What are the factors that determine the state of matter?

2- What are the factors that determine the speed of diffusion in fluids?

3- Can you hold air? And why?

4- Why does water spill out when you tilt a cup?

5- Why doesn't a sugar cube take the shape of the cup?

.....

Lesson 2

6- What factors impact melting and boiling points?

.....

7- What factors impact evaporation process?

.....

8- How can you speed up the process of drying wet clothes in winter?

.....

11

Define the following (what is meant by)

Lesson 1

Matter	.....
Particles	.....
Particle theory of matter	.....
Brownian motion.	.....
Plasma	.....

Lesson 2

Melting	.....
Freezing	.....
Evaporation	.....
Boiling	.....
Condensation	.....
Deposition	.....
Precipitation	.....

Lesson 3

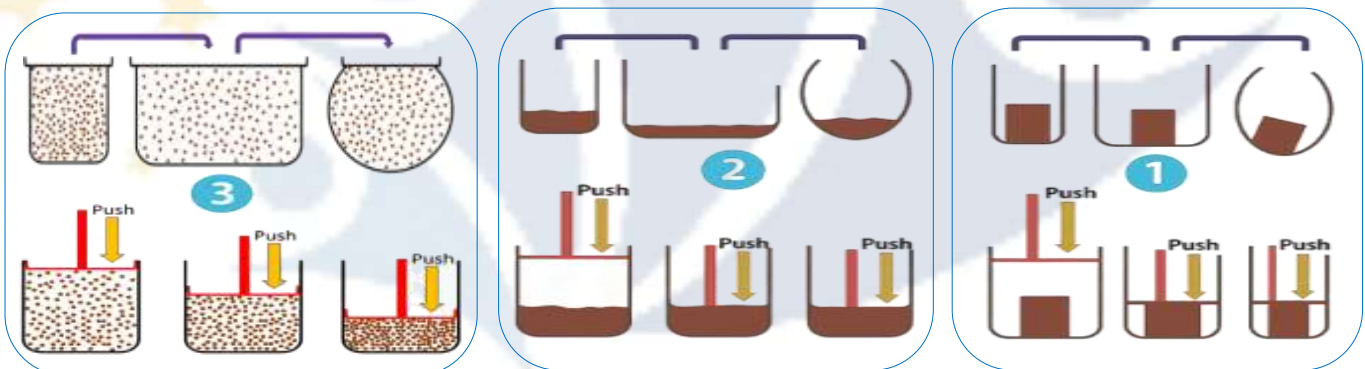
Sublimation	.....
System	.....
Internal energy of system	.....
Temperature of system	.....
Specific heat	.....
Closed system	.....

12

Various questions

Lesson 1

1. Study the following figures, which illustrate the properties of matter states, then identify the numbers of the images and state of matter that represent each of the following:



- 1- Its shape does not change by changing the container
2. Its shape changes while its volume is constant
- 3- Its shape and volume can be changed
- 4-States of matters that can be compressed
- 5-States of matters that cannot be compressed

2. From the opposite figure, the color of potassium Permanganate powder spreads faster in water,
Giving reason?



Hot water cold water

3. Answer the following

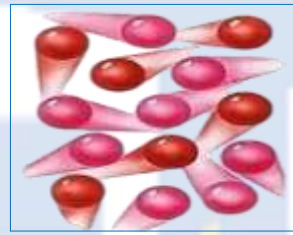
Firstly:

Figure (1) represents the case of

Figure (2) represents the case of

Figure (3) represents the case of

Figure (4) represents the case of



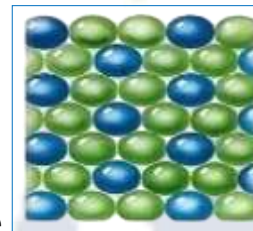
②



①

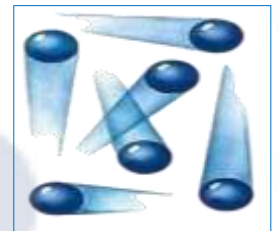
Secondly:

1- The interparticle spaces are as large as possible in the case of and this is attributed to, between particles.



④

2- The interparticle spaces are as small as possible in the case of, and this is attributed to, between particles.



③

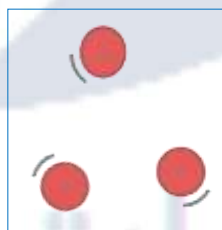
4. Study the opposite figure well, and then answer:

1- Substance No..... can be compressed.

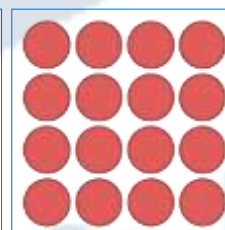
2- Substances..... and are called fluids.

3- Substance retains a constant volume and shape

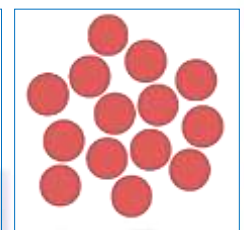
4- The most wide spread substance is because



③



②



①

5. Look at the figure in front of you and complete the following:

1- Matter changes from one state to another

As shown in the figure, either by or

2- When particles of matter acquire

energy the Kinetic energy of particles

increases, and the forces of attraction between

them increases and the distanceIncreases, so it transforms into.....or state.

3- When the particles of matter losethe energy of the particles decreases, and become closer to each other, the attraction forces between them increase, and changes to a liquid or solid state.

4- At normal atmospheric pressure, melting point of ice....., while boiling point of water =

5- The process of is the opposite of the process off

6- The processes of andoccur with a loss of heat energy, while the processes of and occur with a gain of heat energy.



6. Look at the figure in front of you and complete the following:

1. The highest boiling point of water is at the point because

2. The lowest boiling point of water is at the point because

3. At point, the boiling point of water is 100 °C.

4. The boiling point of water at point (B) is higher than its boiling point at point..... and lower than its boiling point at point.....



5. The correct descending order of boiling point of water at the four points is:

☐ (A) → (B) → (C) → (D)

☐ (A) → (D) → (C) → (B)

☐ (D) → (C) → (A) → (B)

☐ (D) → (C) → (B) → (A)

Lesson 3

7. Which system am I?

1- Study the figures shown in the table, then fill in the blanks below:

Point of comparison			
Type of system	.....	.....	.....
Reason for classification	..... .....	..... .....	..... .....

8. Study the correspond figure and then answer:

1- The figure shows.....

2- Name the liquid used in the figure and explain why.

.....



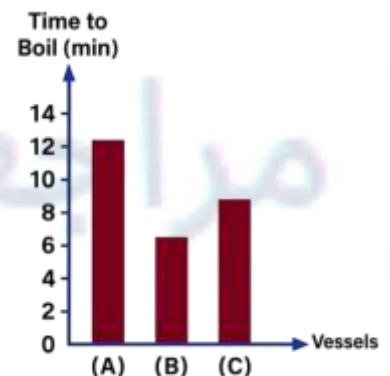
9. The following graph shows the time it takes for three vessels containing different amounts of water to reach boiling point.

a) Which of these vessels contains the largest amount of water?

.....

b) Identify the controlled variable and the independent variable in this experiment. Girl

.....



1

Write down what the following sentences mean:

Lesson 1

- 1- Everything that has mass and volume. (**Matter**)
- 2- A state of matter that has a definite shape and fixed volume. (**solid state**)
- 3- A state of matter that has the ability to spread and be compressed. (**gas state**)
- 4- The state of matter that has a fixed volume and varies in shape with the container that contains it. (**liquid state**)
- 5- A theory that explains the behavior and properties of matter. (**particle theory of matter**)
- 6- The movement of particles of matter in fluids is random in all directions. (**Brownian motion**)
- 7- A state of matter that occurs when gases are ionized into positively and negatively charged ions. (**plasma state**)

Lesson 2

- 8- The change of matter from the solid state to the gaseous state directly (**Sublimation process**)
- 9- The change of matter from the gaseous state to the solid state directly (**deposition process**)
- 10- Coffee dissolves in water faster than regular coffee (**instant coffee**)
- 11- A pot cooks food faster because it traps steam inside (**pressure cooker**)
- 12- The temperature at which matter changes from a solid to a liquid state. (**Melting point**)
- 13- The transformation of matter from a solid state to a liquid state by raising the temperature. (**Melting process**)
- 14- The transformation of matter from a gaseous state to a liquid state by lowering the temperature. (**Condensation process**)

Lesson 3

- 15- The amount of heat required to raise the temperature of 1 kilogram of matter by 1 °C. (**Specific heat capacity**)
- 16- A system in which there is no exchange of energy and matter with the surrounding medium. (**Isolated system**)
- 17- A liquid used in cooling due to its high specific heat value. (**Water**)
- 18- Any part of the universe that is subject to study and observation of changes in energy and matter. (**system**)
- 19- It is considered a measure of the average kinetic energy of the particles in the system. (**temperature**)
- 20- A system in which there is an exchange of matter and energy with the surrounding environment. (**open system**)
- 21- A system in which there is an exchange of energy without matter with the surrounding environment. (**closed system**)

2

Choose the correct answer:

Lesson 1

1- Air and water are similar in that they both

- (A) have mass. (B) can be seen.
(C) have a fixed shape. (D) have a fixed lume.

2- You have two groups of substances, which are:

Group (X), Oil, wood and marble.

Group (Y), Oxygen, nitrogen and hydrogen.

Which of the following represents one of the properties of groups (X) and (Y)?

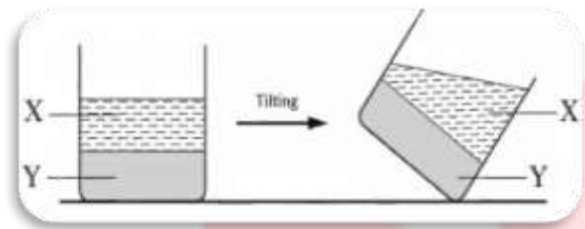
Choices	Group (X)	Group (Y)
(A)	Occupy space	Do not occupy space
(B)	Have fixed shape	Do not have fixed shape
(C)	<u>Have fixed volume</u>	<u>Do not have fixed volume</u>

D

Can be compressed

Can not be compressed

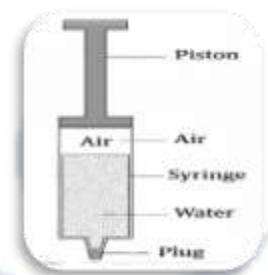
3- When a container containing two substances (X) and (Y) is tilted, their positions become as in the opposite: which of the following determines the state of substances (X) and (Y)?



- (A) (X): Solid, (Y): Liquid.
- (B) (X): Liquid, (Y): Liquid.
- (C) (X): Liquid, (Y): Solid.
- (D) (X): Solid, (Y): Gas.

4- In the opposite figure: What happens to the volume of each of water and air respectively when the piston of the syringe is pressed?

- (A) Decreases, decreases.
- (B) Remains unchanged, increases.
- (C) Remains unchanged, decreases.
- (D) Increases, decreases.



5- Which of the following materials are fluids?

- (A) Ice and liquid water.
- (B) Iron and water vapour.
- (C) Oil and iron.
- (D) Water vapour and liquid water.

6- Which of the following has a definite shape?

- (A) Air.
- (B) Oil.
- (C) Ice.
- (D) Water.

7- Solid matter is characterized by having

- (A) indefinite volume and shape.
- (B) a definite volume and shape.
- (C) a definite shape and indefinite volume.
- (D) a definite volume and indefinite shape.

8- The common property of solids and liquids is that they both

- (A) have a definite volume. (B) have fluidity property.
(C) have a definite shape. (D) can be compressed.

9- Compression of matter means to

- (A) convert it from one state to another. (B) change its mass.
(C) reduce its volume. (D) change the volume of its molecules.

10- The particles of a matter can not be seen with the naked eye, because they

- (A) are very small. (B) vibrate.
(C) move freely. (D) move randomly.

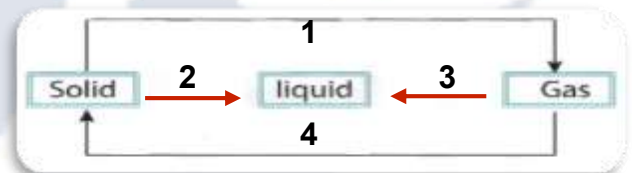
11- It is difficult to bend an iron rod because of

- (A) its compressibility.
(B) its fluidity.
(C) the absence of the interparticle spaces between its molecules.
(D) the strong attraction forces between its molecules.

Lesson 2

12- In the opposite chart:

Which of the following represents the process of sublimation?



- (A) (1) (B) (2) (C) (3) (D) (4)

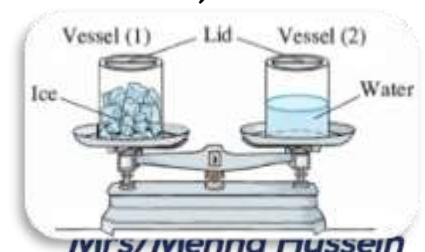
13- The same change in physical state occurs in the processes of

- (A) boiling and condensation. (B) boiling and evaporation.
(C) freezing and condensation. (D) freezing and evaporation.

14- The experiment shown in the opposite figure was conducted:

The two pans of the balance were equal at the beginning of the experiment, After several minutes, the pan holding the vessel (1) moved down, because

- (A) the ice cubes in the vessel (1) melted.



- (B) the water in the vessel (2) evaporated.
- (C) condensation of water vapour inside the vessel (2).
- (D) condensation of water vapour outside the vessel (1).
- 15- The speed of the matter particles increases during processes.
- (A) condensation and evaporation (B) condensation and freezing
- (C) evaporation and melting (D) freezing and melting
- 16- A solid substance, its melting point is 1500°C , changes into its liquid state at
- (A) 1000°C (B) 1500°C (C) 1550°C (D) 2000°C
- 17- The boiling point of water at the top of a mountain its height equals 3000 m is
- (A) 100°C (B) 94°C (C) 90°C (D) 84°C
- 18- Frost formation is a process.
- (A) evaporation. (B) sublimation (C) deposition. (D) condensation.
- 19- Wet clothes dry when exposed to the sun as a result of the process of
- (A) melting. (B) evaporation. (C) boiling. (D) condensation.
- 20- The rate of evaporation increases by increasing all the following, except
- (A) temperature.
- (B) surface area of liquid exposed to evaporation.
- (C) humidity percentage.
- (D) air currents.
- 21- In which of the following processes the substance gains heat energy?
- (A) Freezing (B) Condensation (C) Sublimation (D) Deposition
- 22- When solid dry ice (CO_2) is heated, it turns directly into gas without passing through the liquid state. This process is called...

- (A) Evaporation (B) boiling (C) sublimation (D) melting

Lesson 3

23- The internal energy of water increases when

- (A) the temperature of water changes from 70°C to 60°C
 (B) water vapour condenses on a plant leaf.
 (C) a quantity of water is heated from 20°C to 30°C
 (D) it is placed in a refrigerator.

24- Four equal masses of different metals, (at 25°C), were heated for 10 minutes

Metal	(1)	(2)	(3)	(4)
Temperature after heating	59°C	62°C	55°C	70°C

using the same heat source.

The temperature of each metal is recorded in the opposite table:

Which of these metals is best used in the manufacture of cookware that can withstand high temperatures?

- (A) (1) (B) (2) (C) (3) (D) (4)

25- What are the tools used to find the specific heat of a substance?

- (A) Balance and stopwatch. (B) Balance and thermometer.
 (C) Stopwatch and thermometer. (D) Balance, stopwatch and thermometer.

26- The internal energy of the system increases, when

- (A) the potential energy of its particles increases.
 (B) the kinetic energy of its particles decreases.
 (C) both of its potential energy and kinetic energy decrease.
 (D) its particles stop moving.

27- When a substance is heated, its particles,

- (A) average kinetic energy decreases. (B) average kinetic energy increases.

- (C) potential energy increases. (D) internal energy decreases.

28- All the following are factors that affect the system's temperature, except

- (A) its mass. (B) the type of its matter.
(C) its shape. (D) its physical state.

29- When equal masses of water and ice are heated over a steady flame, the elevation in the temperature of

- (A) water is the greatest.
(B) ice is the greatest
(C) each of water and ice is the same in both cases.
(D) water is twice as that in the case of ice.

30- The specific heat of a metallic ball depends on

- (A) type of its substance. (B) its mass.
(C) its volume. (D) its radius.

31- Which of the following substances has the highest specific heat?

- (A) Water. (B) Aluminium. (C) Iron. (D) Mercury.

32- The internal energy of any system is

- (A) The potential energy of the particles only
(B) The kinetic energy of the particles only
(C) The sum of kinetic energy and potential energy of the particles
(D) The emitted heat

33- When heating a substance, the kinetic energy of the particles

- (A) Decreases (B) Remains unchanged
(C) Increases (D) Disappears

34- The change in temperature is measured by

- (A) Electric potential (B) Distance meter

© Thermometer

Ⓓ Barometer

35- A system that does not exchange matter or energy with surrounding medium is

Ⓐ An open system

Ⓑ A closed system

© An isolated system

Ⓓ A thermal system

36- When the internal energy of a substance increases,

Ⓐ The temperature decreases

Ⓑ The temperature remains the same

© The temperature increases

Ⓓ The particles stop moving

3

Complete the following sentences:

Lesson 1

1. Substances can be classified according to their physical state to **three** common states, that are solid, **liquid**, and gases.
2. Fluids are substances that are in a **liquid** or **gaseous** states
3. The matter is compressed in the **gaseous** state to reduce **its volume**
4. The forces of attraction between particles of liquid matter are **moderate** and the interparticle distances are **moderate**
5. There is a fourth state of matter known as **plasma** It is found in outer space, such as **stars** and the **sun**
6. Plasma is used in air conditioners to purify air by **removing** pollutants and germs.
7. **Sublimation** is a reverse process of deposition process.
8. The forces of attraction between particles of solid matter are **very strong** and the interparticle distances are **very small**.
9. The states of matter vary depending on the **attraction force** between the particles.

Lesson 2

10. The substance changes from one state to another either by **heating** or **cooling**.
11. At normal atmospheric pressure, the melting point of snow = **0°C**, while the boiling point of water **100°C**.
12. The greatest kinetic energy of matter particles is in the **gaseous** state, and the least kinetic energy is in the **solid state**.
13. The interparticle distances are as large as possible in the **gaseous** state due to **weak forces of attraction** between particles.
14. From the factors affecting melting and boiling points **atmospheric pressure** and **degree of purity of the substance**.
15. The speed of drying clothes can be increased by **increasing temperature** or **air current**.
16. Pure water boils at a temperature of **100°C** and as atmospheric pressure increases, the boiling point of water **increases above** 100 °C, while its freezing point **decreases below** 0 °C.
17. As we rise up above the surface of the Earth, atmospheric pressure **decreases** and boiling point of water becomes **less** than 100 °C.
18. Pressure cookers **increase** rate of cooking food by trapping **Steam** and increasing pressure, causing water to boil at a higher temperature than in regular pots.
19. The **condensation** process is the reverse of **evaporation** process and freezing process is the reverse of the of **melting** process.
20. As we go up, atmospheric pressure **decreases** and boiling point of water **less** than 100° C.
21. **Physical** change of matter is not accompanied by the formation of new substances, whereas **chemical** change produces a new substance.
22. The greatest kinetic energy of matter particles is in the **gaseous** state and the least kinetic energy is in the **solid** state.

23. During **melting** and **boiling** processes the temperature of the material remains constant.

Lesson 3

24. The **open** system exchanges energy and matter with the surrounding medium

25. The **isolated** system does not exchange energy or matter with the surrounding medium

26. The **closed** system exchanges energy but not matter with the surrounding medium

27. **The internal energy** is the sum of the kinetic energy and potential energy of all particles of the system

28. **Temperature** represents the degree of hotness or coldness of the system.

29. A system is any part of the **universe** that is under study, where changes in **energy** and **matter** are observed.

30. The systems are divided into **open**, **closed** and **isolated** systems.

31. Change in **temperature** refers to transfer energy from or to the system

4

correct the underlined words:

Lesson 1

1- The flow of liquids differs according to their density. **Viscosity**

2- During the fluidity, the volume of gas does not change, while the volume of solid changes. **liquid/gas**

3- Liquids do not have a definite shape or volume. **Gaseous**

4- Solids have the ability to flow but not to be compressed. **Liquids**

5- The speed of diffusion through solids is equal to the speed of diffusion through gases. **lower than**

6- The interparticle spaces between liquid molecules are equal to the interparticle spaces between gas molecules. **smaller than**

7- Particles suspended in solids move randomly in a phenomenon known as Brownian motion. **fluids**

Lesson 3

8- Cans of soft drinks represent isolated systems. **closed**

9- Heat is a measure of the average kinetic energy of matter's particles.

Temperature

10- A decrease in the average speed of the particles of a matter leads to a stability in their temperature. **decrease**

11- Mercury is an excellent cooling liquid. **Water**

12- The specific heat of ice is equal to the specific heat of liquid water. **less than**

13- The radiator is used to protect car tires from damage. **Engines**

5 Mark (✓) or (X) for each statement, with correction:

Lesson 1

1- **Solids** and liquids are called fluids. (X) **Gaseous**

2- The ability of a fluid to flow **increases** with the increase of the viscosity.
(X) **decrease**

3- The speed of diffusion increases with raising the temperature of the diffusion medium. (✓)

4- The interparticle spaces between particles of matter vary depending on its physical state. (✓)

5- The particles of any matter are in a state of continuous motion. (✓)

6- Attraction forces between particles of **solids** are almost non-existent.
(X) **gaseous**

7- The movement of **gas** particles is limited. (X) **solid**

8- The substances that form the Sun and stars exist in the **gaseous** state.
(X) **plasma**

Lesson 2

9- Pure water boils at **0°C** at normal atmospheric pressure. (X) **100°C**

- 10- The matter changes from one state to another by gaining thermal energy.
(✓)
- 11- During melting and boiling processes, the temperature remains constant.
(✓)
- 12- The temperature decreases by approximately 1°C for every 10 m of altitude. (X) 300m
- 13- Cooking food takes a shorter time in a pressure cooker compared to cooking in a normal cooking pot. (✓)
- 14- Each pure substance has a specific boiling point. (✓)
- 15- Water freezes in polar regions as a result of gaining thermal energy.
(X) losing
- 16- Dry ice is nitrogen in its solid state. (X) carbon dioxide
- 17- The rate of evaporation increases when the air currents above the surface of a liquid increases. (✓)
- 18- Increasing the humidity percentage leads to increasing the rate of evaporation.
(X) decrease
- Lesson 3**
- 19- An open system only exchanges matter with the surroundings.
(X) matter and energy
- 20- The thermos flask represents a closed system. (X) isolated
- 21- The temperature of a substance is a measure of the average kinetic energy of its particles. (✓)
- 22- An increase in the average kinetic energy of the system's particles, leads to an elevation in its temperature. (✓)
- 23- The average kinetic energy of hot water particles is equal to the average kinetic energy of cold water particles. (X) greater

- 24- The average kinetic energy of the system's particles is equal to the kinetic energy of one particle, assuming that the kinetic energies of all particles are equal. (✓)
- 25- Heat transfer from or to an object is indicated by changing its temperature. (✓)
- 26- The amount of change in the temperature of an object increases as its mass **increases** when it gains an amount of heat. (X) **decrease**
- 27- The specific heat of a single substance varies according to its physical state. (✓)

6

Choose the odd word (or phrase) out, then mention the relation between the rest:

- 1- Oil/Alcohol / Water / **Carbon dioxide.** **liquids substance**
- 2- Oxygen/Hydrogen / Ammonia / **Wood.** **gaseous substance**
- 3- Able to flow / Compressible / **Diffusion through it is slow** / Has indefinite shape. **properties of gaseous matter**
- 4- Has a fixed volume / Able to flow / Incompressible / **Has a fixed shape.** **properties of liquid matter**
- 5- Its particles move in a vibrating motion / The attraction forces between its particles are very strong / The interparticle spaces are the least / **cannot diffuse.** **properties of solid matter**
-

7

Give reason for (scientific explanation) for each of the following:

- 1- Solid matter has a fixed shape and a definite volume.

Lesson 1

Because the forces of attraction between its particles are very strong, and the interparticle spaces between them are very small.

2- Gaseous matter has no fixed shape and no definite volume.

Because the forces of attraction between its particles are very weak, and the interparticle spaces between them are very large

3- Liquid matter is flowable.

Because they have fluidity property and take the shape of the container that contains them.

4- Gases are compressible.

Because the forces of attraction between the particles of gases are very weak, and the interparticle spaces between them are very large, so the volume will reduce

5- Particles of matter spread faster in gases than in liquids.

Because the interparticle spaces between them are very large and move randomly and completely free in all direction

6- Plasma is used in air conditioners.

To improve the quality of the air in enclosed spaces and break down harmful air pollutants, germs and viruses

7- It is difficult to break a piece of rock.

Because the forces of attraction between the particles of solid rock are very strong, and the interparticle spaces between them are very small, which makes the particles tightly bound together

8- The possibility of dissolving a quantity of table salt in water.

Because the forces of attraction between the particles of liquid water are relatively weak, and the interparticle spaces between them are relatively large, so they occupied by the table salt particles.

9- Spreading of smoke produces from a candle wick in the air.

Because the forces of attraction between the particles of air are very weak, and the interparticle spaces between them are very large, so smoke particles diffuse in it.

10- Feeling uncomfortable in hot, humid weather.

Because in hot weather, the secretion of sweat increases to reduce the feeling of heat, but when the humidity percentage is high, the rate of sweat evaporation decreases, causing feeling of discomfort.

Lesson 2

11- Wet clothes dry faster on sunny days than on humid days.

Because the higher temperature in sunny days increases the number of molecules that have sufficient thermal energy from the surrounding medium to escape from the surface of the clothes, allowing them to dry quickly.

12- The pressure cooker saves fuel.

Because trapping steam inside it during cooking increases the pressure, which raises the boiling point of water above 100°C , which reduces the cooking time and saves fuel.

13- The boiling point of water decreases with increasing altitude above sea level.

Because as altitude increases above sea level, atmospheric pressure decreases, and the temperature decreases by 1°C for every 300 m of altitude, so the boiling point of water decreases to below 100°C .

14- Water evaporates faster from the pot when the stove temperature is raised.

Due to increasing of the number of molecules that have sufficient thermal energy from the surrounding medium to escape from the surface of the water

15- Clothes dry faster in summer than in winter

Because the higher temperature in summer increases the number of molecules that have sufficient thermal energy allowing them to dry quickly.

16- Wet clothes dry faster when exposed to air currents

Because it increases evaporation of more water molecules from the surface of the liquid.

Lesson 3

17- Mercury is used in the manufacture of thermometers.

Because the specific heat of mercury is low and its temperature rises quickly when it absorbs any amount of heat.

18- Water makes up a large proportion of the human body.

Because the specific heat of water is high, so it maintains a constant body temperature when the temperature of the surroundings changes.

19- Copper is preferred for use in the manufacture of heating utensils due to its thermal properties.

Because the specific heat of copper is less than that of aluminum, consequently copper is thermally preferable to aluminum in the manufacture of heating utensils (cookware)

20- The temperature of ice rises more than that of water when they both acquire the same amount of thermal energy and their masses are equal.

Because the specific heat of ice is less than the specific heat of water.

21- Water is used to cool many systems.

Due to its high specific heat, it absorbs large quantities of thermal energy without a significant increase in its temperature.

8 what can be observed when (what happen if)

Lesson 1

1- A few crystals of potassium permanganate are added to a beaker containing an amount of water.

The potassium permanganate particles diffuse in the water from the region of high concentration to the region of low concentration.

2- A spoonful of sugar is stirred in a cup of water.

The sugar particles occupy the interparticle spaces between the water particles, which leads to the dissolving of sugar in water.

3- Gases are heated to extremely high temperatures in a research laboratory.

The gases become ionized, forming plasma (the fourth state of matter).

4- The liquid substance gains thermal energy.

Lesson 2

The kinetic energy of its particles increases, so its temperature increases and the attraction forces between the particles decreases, and at the boiling point it converts into gaseous state.

5- Ice gains more thermal energy during its melting process.

The kinetic energy of its particles increases, so its temperature increases, and the attraction forces between its particles decreases, and at the melting point (0°C), ice converts into water, and the temperature remains constant for ice and water till complete melting.

6- The atmospheric pressure affecting pure water decreases to below the normal atmospheric pressure.

The boiling point of water decreases below 100°C , and the melting point of ice (freezing point of water) increases above 0°C

7- The temperature of water vapour in the air decreases to below 0°C

Results in its condensation in the form of fog, dew and clouds.

8- A piece of ice is left in the air for a period of time.

Ice melts and converts into water as a result of gaining thermal energy from the surrounding medium.

9- Leaving dry ice in the air.

Dry ice sublimates when it absorbs thermal energy from the surrounding medium.

10- Heating solid iodine.

Solid iodine sublimates to iodine vapour when it is heated.

11- A concentrated spray of regular coffee is exposed to extremely hot dry air.

The evaporation rate increases due to increasing the surface area of the spray droplets exposed to the hot air.

12- The system gains thermal energy from the surroundings.

Lesson 3

The average kinetic energy of its particles increases, resulting in a rise in the temperature of the system.

13- Heating two different masses of distilled water separately at the same temperature for an equal period of time using a steady flame.

The temperature of the smaller mass increases by a greater extent.

14- Heating two equal masses of water and oil separately to the same temperature for an equal period of time using a steady flame.

The temperature of oil rises more than that of water.

15- Heating two equal masses of water and ice separately for an equal period of time using a steady flame.

The temperature of ice rises more than the temperature of water.

- 1- Solid matter, liquid matter and gaseous matter «In terms of: Fluidity - Compressibility - Diffusibility»
- 2- Iron, oil and oxygen «In terms of: Change its shape with the container - Change its volume with compression»
- 3- Ice, water and water vapour «In terms of: Particles movement - spaces - Attraction forces».

(1)

P.O.C	Solid matter	Liquid matter	Gaseous matter
Change in shape when the container is changed	Its shape does not change (Its shape is fixed and definite)	Its shape changes (It takes the shape of the container which contains them)	Its shape changes (It takes the shape of the container which contains them)
Fluidity	Does not have the ability to flow	Have the ability to flow, depending on its viscosity	Have the ability to flow
Compressibility	It is incompressible	It is incompressible	It is compressible
Change in volume due to compression	Its volume does not change (Its volume is fixed and definite)	Its volume does not change (Its volume is fixed and definite)	Its volume decreases (It takes the volume of the container which contains them)
Speed of diffusion through it	Very slow	Average speed (moderate)	Very fast

(2)

P.O.C	Iron	Oil	Oxygen
	Does not change	Changes	Changes
	Does not Change	Does not change	Changes

(3)

P.O.C	Solid matter	Liquid matter	Gaseous matter
Particle motion	Vibrates in its fixed position	Moves more freely	Moves randomly and completely freely
Interparticle spaces	Very small	Relatively large	Very large
Forces of attraction between particles	Very strong	Relatively weak	Very weak

Lesson 2

- 4- Melting point of ice and boiling point of water.
- 5- Melting process and freezing process.
- 6- Evaporation process and condensation process
- 7- Sublimation process and deposition process, with examples.
- 8- Evaporation process and boiling process.

(4)

Melting point of ice	Boiling point of water
The temperature at which ice converts into water by gaining thermal energy. Equals 0°C at normal atmospheric pressure.	The temperature at which water converts into water vapour at a certain point. Equals 100°C at normal atmospheric pressure.

(5)

Freezing process	Melting process
The process of changing of matter from a liquid state to a solid state	The process of changing of matter from a solid state to a liquid state
It occurs by losing thermal energy	It occurs by gaining thermal energy

(6)

Evaporation process	Condensation process
The process of changing of matter from the liquid state to the gaseous state	The process of changing of matter from the gaseous state to the liquid state
It occurs by gaining thermal energy	It occurs by losing thermal energy

(7)

P.O.C	Sublimation process	Deposition process
Definition	The process of change of a substance directly from the solid state to the gaseous state without passing through the liquid state	The process of change of a substance directly from the gaseous state to the solid state without passing through the liquid state
Examples	Dry ice sublimation	Formation of frost on tree branches

(8)

Evaporation process	Boiling process
The process of conversion of matter from the liquid state to the gaseous state at any temperature below its boiling point	The process of conversion of matter from the liquid state to the gaseous state at a certain point, known as the boiling point
It occurs to the molecules on the surface of the liquid	It occurs to all the liquid molecules
It occurs by gaining thermal energy from the surrounding medium or from a heat source	It occurs by gaining thermal energy from a heat source
It takes a relatively long period of time	It takes a relatively short period of time
It is not accompanied by the formation of air bubbles (gases inside the liquid)	It is accompanied by the formation of air bubbles (gases inside the liquid)

Lesson 3

9- Open system, closed system and isolated system (in terms of definition and examples)

10- Solid substance, liquid substance and gaseous substance (in terms of potential energy and kinetic energy)

P.O.C	The open system	The closed system	The isolated system
Definition	A system in which both energy and matter are	A system in which only energy is exchanged but the	A system in which neither energy nor matter is

	exchanged with the surroundings	matter is not exchanged with the surroundings	exchanged with the surroundings
Example	An open container with boiling water	A can of soft drink placed in ice	Thermos contain a hot drink

P.O.C	Solid substances	Liquid substances	Gaseous substances
Potential energy	Maximum	Medium	Almost zero
Kinetic energy	Small	Medium	Very high

10

Answer the following:

Lesson 1

1- What are the factors that determine the state of matter?

Interparticle attraction force, Interparticle spaces, speed of particles (particles motion)

2- What are the factors that determine the speed of diffusion in fluids?

The temperature of medium, state of medium and mass

3- Can you hold air? And why?

No, you cannot hold air in your hand. This is because air is a gas, and gas particles have very weak forces of attraction between them and very large interparticle spaces

4- Why does water spill out when you tilt a cup?

because water is a liquid. Liquids have indefinite shape and take the shape of their container

5- Why doesn't a sugar cube take the shape of the cup?

because sugar is a solid, solids have definite shape and volume

Lesson 2

6- What factors impact melting and boiling points?

The atmospheric pressure and degree of purity of the substance

7- What factors impact evaporation process?

Temperature, surface area of liquid, humidity percentage and air currents

8- How can you speed up the process of drying wet clothes in winter?

Increasing air currents ,decrease humidity

11

Define the following (what is meant by)

Lesson 1

Matter	Everything that has mass and occupies space.
Particles	The small units which composed any matter
Particle theory of matter	One of the theories that has successfully explained the behavior and the properties of matter
Brownian motion.	The random motion of relatively large particles suspended in a fluid in all directions as a result of their continuous collisions with the molecules of the fluid.
Plasma	The fourth state of matter in which the gas becomes a mixture of positively charged ions and negatively charged free electrons.

Lesson 2

Melting	The process in which a solid substance changes to a liquid state when heated to its melting point
Freezing	The process in which a liquid substance changes to a solid state when cooled to its freezing point
Evaporation	The process in which a liquid changes to a gas (vapor) at temperatures below its boiling point, occurring only at the surface of the liquid
Boiling	The process in which a liquid changes rapidly to a gas throughout the entire liquid when heated to its boiling point.
Condensation	The process in which a gas changes to a liquid state when cooled

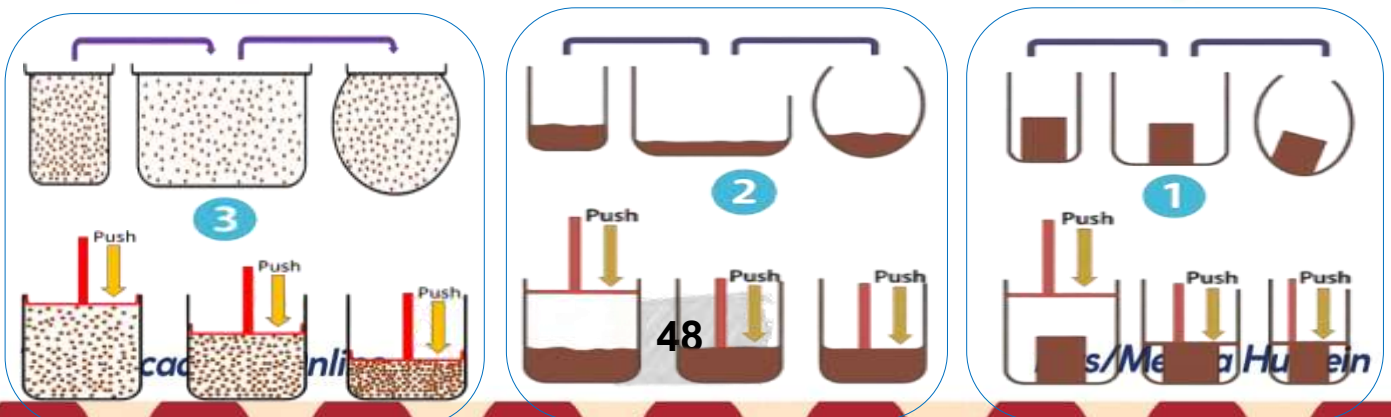
Deposition	The process in which a gas changes directly to a solid state without passing through the liquid state.
Precipitation	The process in which a solid forms from a solution, or water falls from clouds in the atmosphere as rain, snow, sleet, or hail
Sublimation	The change of a substance directly from the solid state to the gaseous state without passing through the liquid state.
Lesson 3	
System	Any part of the universe that is under study where the changes in energy and matter are observed
Internal energy of system	The summation of the potential energy and the kinetic energy of the particles of the system.
Temperature of system	A measure of the average kinetic energy of the particles of the system.
Specific heat	The quantity of heat required to raise the temperature of 1 kg of substance by 1 C
Closed system	A system in which only energy is exchanged with the surroundings, but matter is not exchanged.

12

Various questions

Lesson 1

1. **Study the following figures**, which illustrate the properties of matter states, then identify the numbers of the images and state of matter that represent each of the following:



- 1- Its shape does not change by changing the container (Figure 1)
2. Its shape changes while its volume is constant (Figure 2)
- 3- Its shape and volume can be changed (Figure 3)
- 4-States of matters that can be compressed (Figure 3)
- 5-States of matters that cannot be compressed (Figure 1,2)



Hot water cold water

2. From the opposite figure, the color of potassium Permanganate powder spreads faster in Hot water, Giving reason?

Because in hot water, the particles have higher kinetic energy and move faster than in cold water

3. Answer the following

Firstly:

Figure (1) represents the case of (Plasma state)

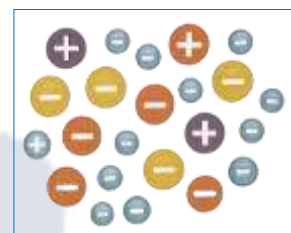
Figure (2) represents the case of (liquid state)

Figure (3) represents the case of (gas state)

Figure (4) represents the case of (solid state)



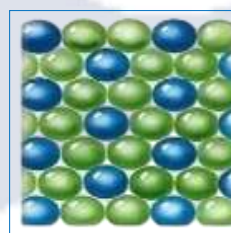
②



①

Secondly:

1- The interparticle spaces are as large as possible in the case of **gas** and this is attributed to **weak forces** between particles.



④

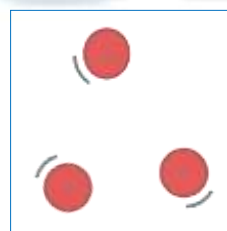
2- The interparticle spaces are as small as possible in the case of **solid** and this is attributed to **strong forces** between particles.



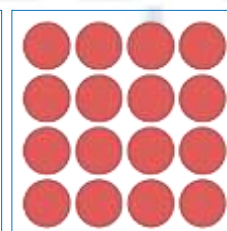
③

4. Study the opposite figure well, and then answer:

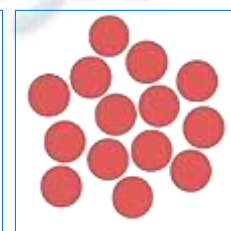
- 1- Substance No.3 can be compressed.
- 2- Substances 1 and 3 are called fluids.
- 3- Substance 2 retains a constant volume and shape



③



②



①

- 4- The most widespread substance is **3** because **its particles are far apart and have weak intermolecular forces**

Lesson 2

5. Look at the figure in front of you and complete the following:

- 1- Matter changes from one state to another

As shown in the figure, either by **heating** or **cooling**

- 2- When particles of matter acquire **heat(thermal)** energy the Kinetic energy of particles

increases, and the forces of attraction between

them increases and the distance **between them**

Increases, so it transforms into **gas**

or **liquid** state.

- 3- When the particles of matter lose **heat** the **kinetic** energy of the particles decreases ,and become closer to each other, the attraction forces between them increase, and changes to a liquid or solid state.

- 4- At normal atmospheric pressure, melting point of ice **0°C**, while boiling point of water = **100°C**

- 5- The process of **melting** is the opposite of the process off **freezing**

- 6- The processes of **freezing** and **condensation** occur with a loss of heat energy, while the processes of **melting** and **evaporation** occur with a gain of heat energy.

6. Look at the figure in front of you and complete the following:

1. The highest boiling point of water is at the point

D because **it has the highest atmospheric pressure**

2. The lowest boiling point of water is at the point

A because **it has the lowest atmospheric pressure**

3. At point **D** the boiling point of water is

100 °C.



4. The boiling point of water at point (B) is higher than its boiling point at point **A** and lower than its boiling point at point **D**
5. The correct descending order of boiling point of water at the four points is:

☐ (A) → (B) → (C) → (D)

☐ (A) → (D) → (C) → (B)

☐ (D) → (C) → (A) → (B)

☒ (D) → (C) → (B) → (A)

Lesson 3

7. Which system am I?

1- Study the figures shown in the table, then fill in the blanks below:

Point of comparison			
Type of system	closed system	Open system	Isolated system
Reason for classification	Exchanges energy only without matter with surroundings	Exchanges both energy (heat) and matter (steam/vapor) with surroundings	Exchanges neither energy nor matter with surroundings

8. Study the corresponding figure and then answer:

3- The figure shows **Radiator**

4- Name the liquid used in the figure and explain why?

Water/ Due to its high specific heat, it absorbs large quantities of thermal energy without a significant increase in its temperature



9. The following graph shows the time it takes for three vessels containing different amounts of water to reach boiling point.

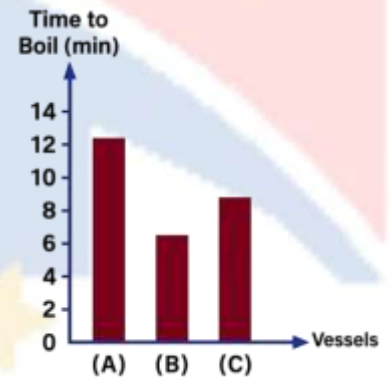
c) Which of these vessels contains the largest amount of water?

(Vessels A) contains the largest amount of water.

d) Identify the controlled variable and the independent variable in this experiment. Girl

Independent variable: The mass of water in each vessel

Controlled variable: The heat source, type of substance



تمت بحمد الله تعالى
بالتوفيق لجميع الطلاب

مراجعات النخبة

حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

اختبار شهر اكتوبر





October Revision

Mr. Ahmed Elbasha

★ **(1) Write the scientific term:**

- 1) Everything that has mass and occupies space. (.....)
- 2) Substances that have fluidity property and take the shape of their container. (.....)
- 3) The ability of fluids to flow easily. (.....)
- 4) The possibility of reducing the volume of a gas by increasing the pressure exerted on it. (.....)
- 5) The movement of particles of matter from a region of high concentration to a region of low concentration. (.....)
- 6) Random motion of relatively large molecules suspended in a fluid in all directions as a result of their continuous collision with the fluid molecules. (.....)
- 7) The fourth state of matter. (.....)
- 8) The state in which gas is in the form of a mixture of positively charged ions and negatively charged free electrons. (.....)
- 9) The point at which the temperature of the substance remains constant during its conversion from the solid state to the liquid state. (.....)
- 10) The temperature at which all the particles of a liquid overcome the forces of attraction between them and change into gas particles. (.....)
- 11) Atmospheric air pressure at sea level. (.....)
- 12) The process of changing matter from the solid state to the gaseous state directly without passing through the liquid state. (.....)

- 13) The process of changing matter from the gaseous state to the solid state directly without passing through the liquid state. (.....)
-
- 14) Solid carbon dioxide. (.....)
-
- 15) Any part of the universe that is under study, where the changes in energy and matter are observed. (.....)
-
- 16) The space surrounding the system which can exchange energy or matter or both with the system. (.....)
-
- 17) A system in which energy and matter are exchanged with the surroundings. (.....)
-
- 18) A system in which only energy is exchanged with the surroundings while matter is not exchanged. (.....)
-
- 19) A system in which neither energy nor matter is exchanged with the surroundings. (.....)
-
- 20) A measure of the average kinetic energy of the system's particles. (.....)
-
- 21) The summation of the potential and the kinetic energies of the system's particles. (.....)
-
- 22) The quantity of heat required to raise the temperature of 1 kg of a substance by 1 °C. (.....)
-
- 23) A cooling system connected to car engines. (.....)

***(2) Choose the right answer:**

1. Air and water are similar in that they both

- a. have mass.
- b. can be seen.
- c. have a fixed shape.
- d. have a fixed volume.

2. Which of the following materials have fluidity property ?

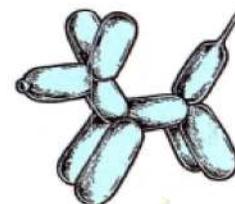
- a. Wood and iron.
- b. Wood and oil.
- c. Water and oxygen.
- d. Iron and air.

3. Which of the following materials are fluids?

- a. Ice and liquid water.
- b. Iron and water vapour.
- c. Oil and iron.
- d. Water vapour and liquid water.

4. The opposite figure: shows a long balloon inflated with air, and shaped like a dog. Which of the following can be concluded about air?

- a. It has no mass.
- b. It has a definite volume.
- c. It does not have a definite shape.
- d. It does not occupy space.



5. Solid matter is characterized by having

- a. indefinite volume and shape.
- b. a definite volume and shape.
- c. a definite shape and indefinite volume.
- d. a definite volume and indefinite shape

6. The common property of solids and liquids is that they both

- a. have a definite volume.
- b. have fluidity property.
- c. have a definite shape.
- d. can be compressed.

7. Compression of matter means to

- a. convert it from one state to another.
- b. change its mass.
- c. reduce its volume.
- d. change the volume of its molecules.

8. The particles of a matter can not be seen with the naked eye, because they

- a. are very small.
- b. vibrate.
- c. move freely.
- d. move randomly.

9. The interparticle spaces are greatest in

- a. iron.
- b. oxygen.
- c. water.
- d. oil.

10.All the following are correct according to the particle theory of matter, except

- a. particles of solid matter have attraction forces between them.
- b. particles of gaseous matter move randomly in straight lines.
- c. particles of liquid matter are separated by interparticle spaces.
- d. particles of any matter can be seen with the naked eye.

11.It is difficult to bend an iron rod because of

- a. its compressibility.
- b. its fluidity.
- c. the absence of the interparticle spaces between its molecules.
- d. the strong attraction forces between its molecules.

12.The movement of gas particles is

- a. circular.
- b. vibrating.
- c. random.
- d. wavey.

13.Upon comparing water molecules with oxygen molecules, water molecules are

- a. slower and more distant from each other.
- b. faster and more distant from each other.
- c. slower and closer to each other.
- d. faster and closer to each other.

14.The same change in physical state occurs in the processes of

- a. boiling and condensation.
- b. boiling and evaporation.
- c. freezing and condensation.
- d. freezing and evaporation.

15.The speed of the matter particles increases duringprocesses.

- a. condensation and evaporation
- b. condensation and freezing
- c. evaporation and melting
- d. freezing and melting

16.A solid substance, its melting point is 1500°C, changes into its liquid state at

- a. 1000°C
- b. 1500°C
- c. 1550°C
- d. 2000°C

17.The boiling point of water at the top of a mountain its height equals 3000 m is

- a. 100°C
- b. 94°C
- c. 90°C
- d. 84°C

18.When sodium chloride dissolves in water,

- a. the melting point of the solution increases.
- b. the boiling point of the solution increases.
- c. the boiling point of the solution decreases.
- d. the melting point of the solution does not change.

19. All the following describe the changes in the states of water, except that they are

- a. reversible processes.
- b. physical processes.
- c. chemical processes.
- d. accompanied by heat change.

20. All the following processes require gaining of heat, except

- a. boiling.
- b. melting.
- c. evaporation.
- d. freezing.

21. The reverse process of melting is the process.

- a. deposition
- b. condensation
- c. freezing
- d. sublimation

22. Frost formation is a process.

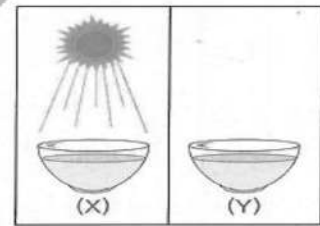
- a. evaporation.
- b. sublimation.
- c. deposition.
- d. condensation.

23. Wet clothes dry when exposed to the sun as a result of the process of

- a. melting.
- b. evaporation.
- c. boiling.
- d. condensation.

24. In the opposite figure: The rate of evaporation is

- a. very fast in both containers (X) and (Y).
- b. very slow in both containers (X) and (Y).
- c. greater in container (Y) than in container (X).
- d. slower in container (Y) than in container (X).



25. The rate of evaporation increases by increasing all the following, except

- a. temperature.
- b. surface area of liquid exposed to evaporation.
- c. humidity percentage.
- d. air currents.

26. What is the relation between the closed system and the surroundings ?

- a. Matter and energy are exchanged between them.
- b. Matter is exchanged between them but not energy.
- c. Energy is exchanged between them but not matter.
- d. Neither matter nor energy is exchanged between them.

27. What is the relation between the isolated system and the surroundings?

- a. Only heat exchange takes place between them.
- b. Both matter and heat are exchanged between them.
- c. Only matter is exchanged between them.
- d. Neither matter nor heat is exchanged between them.

28. The internal energy of the system increases, when

- a. the potential energy of its particles increases.
- b. the kinetic energy of its particles decreases.
- c. both of its potential energy and kinetic energy decrease.
- d. its particles stop moving.

29. When a substance is heated, its particles,

- a. average kinetic energy decreases.
- b. average kinetic energy increases.
- c. potential energy increases.
- d. internal energy decreases.

30. When equal masses of water and ice are heated over a steady flame, the elevation in the temperature of

- a. water is the greatest.
- b. ice is the greatest
- c. each of water and ice is the same in both cases.
- d. water is twice as that in the case of ice.

31. Which of the following substances has the highest specific heat?

- a. Water.
- b. Iron.
- c. Aluminum.
- d. Mercury.

✱(3) Complete the following :

1. matter has fluidity property and is compressible, while matter has fluidity property, but it is incompressible.
2. Diffusion through is very fast, while diffusion through is very slow.
3. The particles of the same substance are, but they are from one substance to another.
4. Particles of matter have energy due to their continuous motion, and they have energy due to the presence of attraction forces between them.
5. The interparticle spaces between iron molecules are, while the interparticle spaces between hydrogen molecules are
6. The attraction forces between particles are the greatest in matter, while they are almost non-existent in matter.
7. The scientist discovered the random motion of the large particles suspended in fluids, which is known as
8. At normal atmospheric pressure, the melting point of ice is $^{\circ}\text{C}$ while the boiling point of water is $^{\circ}\text{C}$
9. The temperature at which ice starts to convert into water is called, while the temperature at which water in all its parts starts to convert into water vapour is called
10. When the atmospheric pressure decreases, the boiling points of liquids
11. The and processes are accompanied by losing thermal energy during matter conversions.

12. The and processes are accompanied by gaining thermal energy during matter conversions.
13. Evaporation is the reverse process of, while sublimation is the reverse process of
14. The process occurs only to the molecules of the surface of a liquid, while the process occurs to all parts of the liquid.
15. The evaporation process takes a relatively period of time, while the boiling process takes a relatively period of time.
16. Systems are classified according to their ability to exchange energy and matter with the surroundings into, closed system or
17. Energy exchange occurs in both and systems.
18. Matter exchange does not occur in both and systems.
19. When a matter gains a quantity of thermal energy, the average kinetic energy of its particles, and therefore its temperature
20. The potential energy of a matter is at its maximum, while it is almost zero in matter.
21. Gaining thermal energy by an object its temperature, while losing thermal energy its temperature.
22. When two equal masses of water and oil are heated over a steady flame, the elevation in the temperature of is greater than that of
23. When the specific heat of a substance is high, the amount of energy required to raise its temperature is, and it takes time to lose the energy it gained.

✱(4) **Correct the underlined words:**

1	The flow of liquids differs according to their <u>density</u> .	(.....)
2	<u>Liquids</u> do not have a definite shape or volume.	(.....)
3	<u>Solids</u> have the ability to flow but not to be compressed.	(.....)
4	The speed of diffusion through solids is <u>equal to</u> the speed of diffusion through gases.	(.....)
5	The interparticle spaces between liquid molecules are <u>equal to</u> the interparticle spaces between gas molecules.	(.....)
6	The <u>open</u> system only exchanges energy with the surroundings.	(.....)
7	Cans of soft drinks represent <u>isolated</u> systems.	(.....)
8	<u>Heat</u> is a measure of the average kinetic energy of matter's particles.	(.....)
9	A decrease in the average speed of the particles of a matter leads to <u>a stability</u> in their temperature.	(.....)
10	<u>Mercury</u> is an excellent cooling liquid.	(.....)
11	The specific heat of ice is <u>equal to</u> the specific heat of liquid water.	(.....)

✳(5) Put ($\checkmark$) or (X) :

1. Solids and liquids are called fluids. ()
2. The shape of a fluid changes according to the shape of the path in which it moves. ()
3. The ability of a fluid to flow increases with the increase of the viscosity. ()
4. The particles of the same substance are different from each other. ()
5. Interparticle spaces between particles of matter vary depending on physical state. ()
6. Attraction forces between particles of solids are almost non-existent. ()
7. The movement of gas particles is limited. ()
8. Pure water boils at 0°C at normal atmospheric pressure. ()
9. When water boils, the forces of attraction between the particles increase and the interparticle spaces between them decrease. ()
10. The melting point of wax is equal to that of table salt. ()
11. Water freezes in polar regions as a result of gaining thermal energy. ()
12. Dry ice is nitrogen in its solid state. ()
13. Increasing the humidity percentage leads to increasing the rate of evaporation. ()
14. An open system only exchanges matter with the surroundings. ()
15. The thermos flask represents a closed system. ()
16. Temperature of a substance is a measure of average kinetic energy of its particles. ()
17. The average kinetic energy of hot water particles is equal to the average kinetic energy of cold water particles. ()
18. The amount of change in the temperature of an object increases as its mass increases when it gains an amount of heat. ()

***(6) Give reasons for each of the following :**

1. Solids have a definite shape and volume.
2. Gaseous matter does not have a definite shape or volume.
3. The diffusion of candle smoke in the air.
4. Formation of water droplets on the outer surface of a cup containing iced water.
5. Evaporation rate increases by increasing the temperature.
6. Evaporation rate increases when the air currents increases.
7. A cup of hot tea represents an open system.
8. The temperature of the liquid decreases when it loses a quantity of thermal nergy.
9. The specific heat is a characteristic property of a substance.
10. Water is an excellent cooling liquid.

***(7) What are the results of the following :**

1. Gases are heated to extremely high temperatures in a research laboratory.
2. The liquid substance gains thermal energy.
3. A piece of ice is left in the air for a period of time.
4. Heating solid iodine.
5. The system gains thermal energy from the surroundings.
6. Heating two equal masses of water and ice separately for an equal period of time
using a steady flame.

*(8) Problems:

1 From the opposite figure:

(1) Which of the two figures represents a fluid, and what is its state?

(2) Compare the states of matter shown in the two figures, in terms of :

- 1- The forces of attraction between particles.
- 2- The movement of particles.

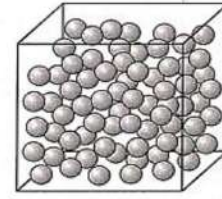


Figure (1)

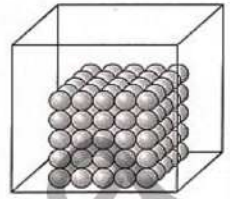
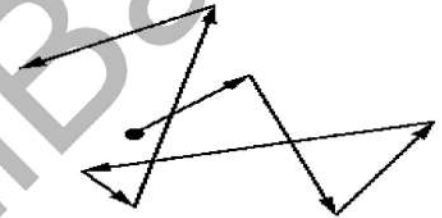


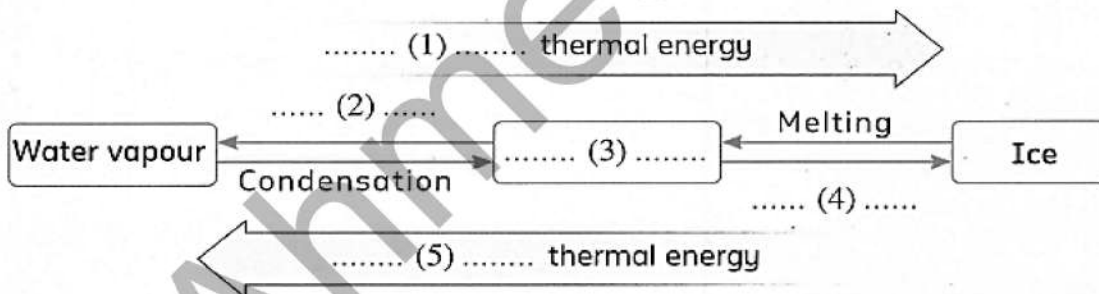
Figure (2)

2 The opposite figure: shows the path taken by one particle of smoke in the air.

Explain why the smoke particle moves in this manner?

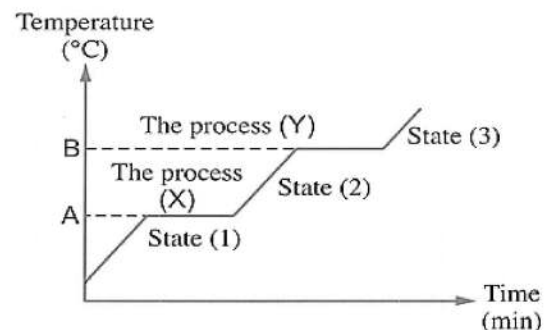


3 Complete the following chart:



4 Name each of the following:

- (1) States of matter (1), (2) and (3).
- (2) Processes (X) and (Y).
- (3) Points (A) and (B).



Model Answer

★ (1) Write the scientific term:

1. Matter	8. Plasma	13. Deposition	20. Temperature
2. Fluids	9. Melting point	14. Dry ice	21. Internal energy
3. Fluidity	10. Boiling point	15. System	22. Specific heat
4. Compressibility	11. Normal atmospheric pressure	16. Surrounding	23. Radiator
5. Diffusion	12. Sublimation	17. Open system	
6. Brownian motion		18. Closed system	
7. Plasma		19. Isolated system	

★(2) Choose the right answer:

1. A	5. B	9. B	13. C	17. C	21. C	25. C	29. B
2. C	6. A	10. D	14. B	18. B	22. C	26. C	30. B
3. D	7. C	11. D	15. C	19. C	23. B	27. D	31. A
4. C	8. A	12. C	16. B	20. D	24. D	28. A	

★(3) Complete the following :

1. gas – liquids	13. Condensation – deposition
2. gases – solids	14. Evaporation – boiling
3. Similar – different	15. Long – short
4. Kinetic – potential	16. Open – isolated
5. Small – large	17. Open – closed
6. Solid – gas	18. Closed – isolated
7. Brown – Brownian motion	19. Increase – increase
8. 0 – 100	20. Solid – gas
9. Melting point – boiling point	21. Increase – decrease
10. Decrease	22. Oil – water
11. Freezing – condensation	23. Increase – longer
12. Evaporation – melting	

★(4) Correct the underlined words:

1. Viscosity	5. Less than	9. Decrease
2. Gas	6. Closed	10. Water
3. Liquid	7. Closed	11. Less than
4. Slower than	8. Temperature	

★(5) Put (√) or (X) :

1. (X)	5. (√)	9. (X)	13. (X)	17. (X)
2. (√)	6. (X)	10. (X)	14. (X)	18. (√)
3. (X)	7. (X)	11. (X)	15. (X)	
4. (X)	8. (X)	12. (X)	16. (√)	

*(6) Give reasons for each of the following :

1. Because the forces of attraction between its particles are very strong, and the interparticle spaces between them are very small.
2. Because the forces of attraction between its particles are very weak, and the interparticle spaces between them are very large.
3. Because the forces of attraction between the particles of air are very weak, and the interparticle spaces between them are very large, so smoke particles diffuse in it.
4. Because the water vapour in the air condenses into water droplets on the outer surface of the iced water cup as a result of losing thermal energy.
5. Due to increasing of the number of molecules that have sufficient thermal energy from the surrounding medium to escape from the surface of the liquid.
6. Because it increases evaporation of more water molecules from the surface of the liquid.
7. Because energy and matter are exchanged with the surroundings.
8. Because when the system (liquid) loses thermal energy, the average kinetic energy of its particles decreases.
9. Because it varies according to the type of substance and it is a constant value for each substance.
10. Due to its high specific heat, it absorbs large quantities of thermal energy without a significant increase in its temperature.

*(7) What are the results of the following :

1. The gases become ionized, forming plasma (the fourth state of matter).
2. The kinetic energy of its particles increases, so its temperature increases and the attraction forces between the particles decreases, and at the boiling point it converts into gaseous state.
3. Ice melts and converts into water as a result of gaining thermal energy from the surrounding medium.
4. Solid iodine sublimates to iodine vapour when it is heated.
5. The average kinetic energy of its particles increases, resulting in a rise in the temperature of the system.
6. The temperature of ice rises more than the temperature of water.

*(8) Problems:

1	1. Fig(1) 2. 1. Medium – vibration 2. large - vibration	3	1. Lose 2. Evaporation 3. Water 4. Freezing 5. Gain
2	Due to collision of smoke particles with air particles	4	1. 1-solid – liquid 2- liquid 3- liquid – gas 2. X – melting Y - boiling 3. Melting point Boiling point

حمل الآن

مجاناً وحصرياً

المراجعة رقم (5)

اختبار شهر اكتوبر





October questions bank

Question01

Write scitific term

1. The ability of fluids to flow easily. (.....)
2. The possibility of decreasing the volume of gases by increasing the pressure exerted on them. (.....)
3. The random motion of large particles suspended in a fluid due to collisions with fluid molecules. (.....)
4. The fourth state of matter in which gases become a mixture of ions and electrons. (.....)
5. The process by which particles move from a region of high concentration to low concentration. (.....)
6. Materials that have the property of fluidity and take the shape of the container. (.....)
7. Everything that has mass and occupies space. (.....)
8. The change of a substance directly from solid to gas without passing through liquid. (.....)
9. The change of a substance directly from gas to solid without passing through liquid. (.....)
10. Carbon dioxide in its solid state. (.....)
11. Science that studies water. (.....)
12. The summation of potential and kinetic energy of the system's particles. (.....)



13. A system that exchanges both matter and energy with its surroundings. (.....)
14. A system that exchanges only energy but not matter with its surroundings. (.....)
15. A system that does not exchange energy or matter with its surroundings. (.....)
16. The quantity of heat required to raise the temperature of 1 kg of a substance by 1°C . (.....)
17. A measure of the average kinetic energy of the particles of a system. (.....)
18. The process of converting liquid to gas at any temperature below its boiling point. (.....)
19. The process of converting gas to liquid by losing thermal energy. (.....)
20. The process of changing matter from liquid to solid state. (.....)
21. The process of changing matter from solid to liquid state. (.....)
22. The process of converting solid directly to gas when heated. (.....)
23. The process of converting gas directly to solid when cooled. (.....)
24. A system in which neither energy nor matter is exchanged. (.....)
25. The total energy stored in the particles of a system. (.....)



Question02.

Choose

1. Matter is anything that has:

- (a) Color and weight. (b) Mass and occupies space
(c) Shape and color. (d) Volume and weight

2. The system that transfers energy and matter is called:

- (a) open . (b) thermal . (c) closed (d) isolated

3. Which state of matter has a definite shape and volume?

- (a) Solid . (b) Liquid (c) Gas (d) Plasma

4. The process of changing from solid to gas directly is called:

- (a) Condensation (b) Evaporation
(c) Sublimation . (d) Freezing

5. The movement of matter particles from high to low concentration is called:

- (a) Diffusion . (b) Compression
(c) Expansion . (d) Condensation

6. The fourth state of matter is:

- (a) Solid (b) Liquid (c) Gas (d) Plasma

7. The forces of attraction between solid particles are:

- (a) Very strong (b) Weak (c) Very weak (d) Moderate

8. Liquids have:

- (a) Definite shape and volume
(b) Indefinite shape and definite volume
(c) Definite shape and indefinite volume



(d) Indefinite shape and volume

9. Gases are:

- (a) Compressible . (b) Incompressible
(c) Fixed in shape (d) Fixed in volume

10. The random motion of suspended particles in a fluid is called:

- (a) Diffusion (b) Brownian motion
(c) Condensation (d) Evaporation

11. The ability of fluids to flow easily is called:

- (a) Fluidity (b) Viscosity . (c) Density (d) Diffusion

12. Which of the following is an example of plasma?

- (a) Steam . (b) Lightning . (c) Smoke . (d) Fog

13. When a liquid changes to gas at its boiling point, the process is:

- (a) Evaporation (b) Condensation (c) Boiling (d) Sublimation

14. The process of changing gas to liquid is:

- (a) Evaporation (b) Condensation (c) Melting (d) Freezing

15. The process of changing a solid to liquid is called:

- (a) Boiling . (b) Condensation
(c) Melting . (d) Freezing

16. When dry ice is left in air, it:

- (a) Melts . (b) Freezes . (c) Sublimes (d) Condenses

17. When the temperature of water vapor drops below 0°C , it:

- (a) Evaporates (b) Condenses (c) Freezes (d) Sublimes



18. The process opposite to sublimation is called:

- (a) Deposition . (b) Melting
(c) Evaporation . (d) Freezing

19. At mountain peaks, water boils below 100°C because:

- (a) Pressure increases . (b) Pressure decreases
(c) Temperature increases (d) Gravity decreases

20. Fuel consumption decreases in a pressure cooker because:

- (a) Pressure increases boiling point
(b) Pressure decreases boiling point
(c) Temperature decreases
(d) Steam escapes

21. The particles of matter are:

- (a) Stationary . (b) In continuous motion
(c) At rest . (d) Only vibrate

22. Which of the following is a reversible change?

- (a) Burning paper . (b) Melting ice
(c) Cooking food (d) Rusting iron

23. The gas that diffuses faster in air is:

- (a) Ammonia (b) Hydrogen chloride
(c) Oxygen . (d) Carbon dioxide

24. The change of liquid to gas below boiling point is:

- (a) Boiling (b) Condensation (c) Evaporation (d) Melting

25. The rate of evaporation increases by:

- (a) Decreasing temperature (b) Increasing surface area



(c) Increasing humidity

(d) Removing air currents

26. Water is used in car radiators because it has:

(a) Low specific heat

(b) High specific heat

(c) Low boiling point

(d) Low density

27. Mercury is used in thermometers because:

(a) It is cheap

(b) It has low specific heat

(c) It is solid

(d) It is colorless

28. A cup of hot tea is an example of:

(a) Closed system

(b) Open system

(c) Isolated system

(d) Solid system

29. A thermos flask represents:

(a) Open system

(b) Closed system

(c) Isolated system

(d) Partial system

30. A pressure cooker is an example of:

(a) Closed system

(b) Open system

(c) Isolated system

(d) Fixed system

31. When gases are heated, their volume:

(a) Increases

(b) Decreases

(c) Remains constant

(d) Disappears

32. Solids are difficult to compress because:

(a) Their particles are far apart

(b) They have strong attraction forces

(c) They have high kinetic energy

(d) They have weak attraction forces



33. Liquids flow easily because

- (a) They have small inter particle spaces
- (b) They have weak attraction forces
- (c) They have strong attraction forces
- (d) They have no spaces

34. The diffusion of fragrance is faster in day than at night because:

- (a) High temperature . (b) Low temperature
- (c) Humidity . (d) Pressure

35. The particles of gases move:

- (a) In fixed positions (b) Randomly
- (c) In circular paths . (d) Slowly

36. Solids have definite volume because:

- (a) Their particles move freely
- (b) Their particles are very close
- (c) Their particles are far apart
- (d) Their temperature is low

37. Liquids are not compressible because:

- (a) Their particles are fixed
- (b) They have no spaces
- (c) Their particles are close together
- (d) They are cold

38. The inter particle spaces in gases are:

- (a) Small . (b) Very small (c) Large . (d) Fixed



39. When ice melts, the temperature remains constant because:

- (a) It loses heat . (b) It gains no energy
(c) The heat breaks attraction forces (d) It evaporates

Question03

Give reason for

1. The difference between the flow rate of honey and the flow rate of water.

2. The diffusion of fragrance during the day is better than its diffusion at night.

3. Solids have a definite shape and volume.

4. Liquids have an indefinite shape and a definite volume.

5. Gaseous matter does not have a definite shape or volume.

6. It is difficult to break a piece of rock.

7. Table salt dissolves in water.

8. Candle smoke diffuses in air.



9. During melting and boiling, the temperature remains constant despite heating.

10. The purity of substances can be verified by comparing melting or boiling points.

11. The boiling point of pure water is less than 100°C at mountain peaks.

12. Fuel consumption decreases when cooking with a pressure cooker.

13. The boiling point of a glucose solution is higher than that of distilled water.

14. Water droplets form on the outer surface of a cup containing iced water.

15. Matter conversions between states are reversible.

16. Evaporation takes longer than boiling.

17. Wet clothes dry faster in summer than in winter.

18. Evaporation rate increases with temperature.



19. Evaporation rate increases when surface area increases.

20. Evaporation rate increases when air currents increase.

21. We feel uncomfortable in hot and humid weather.

22. Water is an excellent cooling liquid.

23. Mercury is used in thermometers.

24. The human body contains a large percentage of water.

25. The potential energy of solids is maximum, while that of gases is almost zero.

26. A cup of hot tea represents an open system.

27. A pressure cooker represents a closed system.

28. A thermos represents an isolated system.

29. When heating oil and water equally, oil's temperature rises faster.



30. Copper is preferred for heating pots.

Question04

What happen if

1. A few crystals of potassium permanganate are added to a beaker containing water.

2. A spoonful of sugar is stirred in a cup of water.

3. Gases are heated to extremely high temperatures in a research laboratory.

4. The piston of a syringe filled with air is pressed.

5. The piston of a syringe filled with water is pressed.

6. The piston of a syringe filled with fine sand is pressed.

7. A piece of ice is left in the air for a period of time.

8. Dry ice is left in the air.

9. Solid iodine is heated.

10. A concentrated coffee spray is exposed to hot dry air.



11. A liquid substance gains thermal energy.

12. Ice gains more thermal energy during melting.

13. The atmospheric pressure affecting pure water decreases.

14. The temperature of water vapor decreases below 0°C .

15. During melting and boiling, heating continues.

16. Wet clothes are left to dry in summer.

17. Wet clothes are left to dry in winter.

18. Air currents increase around a liquid surface.

19. The temperature of a gas is raised.

20. The temperature of a liquid decreases when it loses heat.

21. A system gains thermal energy from its surroundings.



22. A system loses thermal energy to its surroundings.

23. Two equal masses of water and oil are heated for the same time.

24. Two different masses of water are heated equally.

25. Two equal masses of ice and water are heated.

26. Air pressure increases on boiling water.

27. Air pressure decreases on boiling water.

28. Steam is trapped inside a pressure cooker.

29. A cup of hot tea is left uncovered.

30. A metal rod is heated.

Question05

Compare between (in one point)

1. Solid matter vs Liquid matter

2. Liquid matter vs Gaseous matter



3. Solid matter vs Gaseous matter

4. Evaporation process vs Boiling process

5. Melting process vs Freezing process

6. Evaporation process vs Condensation process

7. Sublimation process vs Deposition process

8. Open system vs Closed system

9. Closed system vs Isolated system

10. Potential energy vs Kinetic energy

11. Solid substances vs Liquid substances vs Gaseous substances

12. Water vs Oil when heated

13. Evaporation in summer vs winter

14. Boiling point at sea level vs mountain top



15. Pure water vs Glucose solution

16. Diffusion in hot air vs cold air

17. Honey vs Water in flow rate

18. Rock vs Salt solution in particle forces

19. Ammonia gas vs Hydrogen chloride gas diffusion

20. Copper vs Aluminum for heating pots

Question0 6

ComComplete complete

1. Matter is anything that has _____ and occupies _____.
2. Fluids are materials that have the property of _____ and take the shape of the _____ that contains them.
3. The ability of fluids to flow easily is called _____.
4. The possibility of decreasing the volume of gases by increasing the pressure exerted on them is called _____.
5. The movement of particles from a region of high concentration to a region of low concentration is called _____.
6. The random motion of large particles suspended in a fluid is known as _____.



7. The fourth state of matter in which gas becomes a mixture of ions and free electrons is called _____.
8. Solids have a definite _____ and _____.
9. Liquids have an indefinite _____ and definite _____.
10. Gases have neither definite _____ nor definite _____.
11. The process of changing matter from a solid to a liquid by gaining thermal energy is called _____.
12. The process of changing matter from a liquid to a gaseous state at a specific temperature is called _____.
13. The process of changing matter directly from solid to gas is called _____.
14. The process of changing matter directly from gas to solid is called _____.
15. The temperature at which a liquid changes to a gas is called its _____.
16. The temperature at which a solid changes to a liquid is called its _____.
17. The change of gaseous water into liquid is called _____.
18. The change of liquid water into vapor is called _____.
19. During melting and boiling, the temperature _____ constant.
20. The boiling point of pure water at sea level is _____ °C.
21. The melting point of pure ice at normal pressure is _____ °C.
22. At higher altitudes, the boiling point of water _____ because atmospheric pressure _____.



23. The boiling point of pure water at the Alps Mountain (4800 m above sea level) is about _____ °C.
24. When altitude increases by 300 m, the boiling point decreases by _____ °C.
25. Factors affecting the boiling point include _____ and _____.
26. Evaporation rate increases by increasing _____.
27. Evaporation rate increases by increasing the _____ of the liquid exposed to air.
28. Evaporation rate increases when _____ increases.
29. Evaporation rate decreases when _____ increases.
30. Factors affecting the rate of evaporation are _____, _____, _____, and _____.
31. The factors affecting change in temperature of a substance are _____, _____, and _____.
32. When the system gains thermal energy, its temperature _____.
33. When the system loses thermal energy, its temperature _____.
34. The specific heat is the amount of heat required to raise the temperature of _____ kg of a substance by _____ °C.
35. Water is used as a cooling liquid because it has _____ specific heat.
36. Mercury is used in thermometers because it has _____ specific heat.
37. The open system exchanges both _____ and _____ with the surroundings.



38. The closed system exchanges only _____ but not _____ with the surroundings.
39. The isolated system exchanges neither _____ nor _____ with the surroundings.
40. The sum of potential and kinetic energy of particles in a system is called _____.
41. A measure of the average kinetic energy of particles is called _____.

Question0 7

Com

Calculate

1. The boiling point of water at 3000 m above sea level =
2. The boiling point of water at 4500 m above sea level =
3. When altitude increases by 300 m, the boiling point decreases by

1 Study the following figure, then answer:
The following diagram shows three systems:



Question:



Match each case with its correct type of system:

- a) Open system
- b) Closed system
- c) Isolated system

Answer: (1) → Open system | (2) → Closed system | (3) → Isolated system

[2] What is the importance of the plasma state?

[3] What is the technological application based on surface area affecting evaporation?

[4] Mention the factors affecting the rate of evaporation of liquids.

إعداد

د/ سالي أحمد





October questions bank

Question01

Write scitific term

1. The ability of fluids to flow easily. (**Fluidity**)
2. The possibility of decreasing the volume of gases by increasing the pressure exerted on them. (**Compressibility**)
3. The random motion of large particles suspended in a fluid due to collisions with fluid molecules. (**Brownian motion**)
4. The fourth state of matter in which gases become a mixture of ions and electrons. (**Plasma state**)
5. The process by which particles move from a region of high concentration to low concentration. (**Diffusion**)
6. Materials that have the property of fluidity and take the shape of the container. (**Fluids**)
7. Everything that has mass and occupies space. (**Matter**)
8. The change of a substance directly from solid to gas without passing through liquid. (**Sublimation**)
9. The change of a substance directly from gas to solid without passing through liquid. (**Deposition**)
10. Carbon dioxide in its solid state. (**Dry ice**)
11. Science that studies water. (**Hydrology**)
12. The summation of potential and kinetic energy of the system's particles. (**Internal energy**)



13. A system that exchanges both matter and energy with its surroundings. (**Open system**)
14. A system that exchanges only energy but not matter with its surroundings. (**Closed system**)
15. A system that does not exchange energy or matter with its surroundings. (**Isolated system**)
16. The quantity of heat required to raise the temperature of 1 kg of a substance by 1°C . (**Specific heat**)
17. A measure of the average kinetic energy of the particles of a system. (**Temperature**)
18. The process of converting liquid to gas at any temperature below its boiling point. (**Evaporation**)
19. The process of converting gas to liquid by losing thermal energy. (**Condensation**)
20. The process of changing matter from liquid to solid state. (**Freezing**)
21. The process of changing matter from solid to liquid state. (**Melting**)
22. The process of converting solid directly to gas when heated. (**Sublimation**)
23. The process of converting gas directly to solid when cooled. (**Deposition process**)
24. A system in which neither energy nor matter is exchanged. (**Isolated system**)
25. The total energy stored in the particles of a system. (**Internal energy of the system**)



Question02.

Choose

1. Matter is anything that has:

- (a) Color and weight. (b) **Mass and occupies space**
(c) Shape and color. (d) Volume and weight

2. The system that transfers energy and matter is called

- (a) open. (b) thermal. (C) closed. (d) isolated

3. Which state of matter has a definite shape and volume?

- (a) **Solid** (b) Liquid. (c) Gas. (d) Plasma

4. The process of changing from solid to gas directly is called:

- (a) Condensation (b) Evaporation (c) **Sublimation** (d) Freezing

5. The movement of matter particles from high to low concentration is called:

- (a) **Diffusion** (b) Compression
(c) Expansion (d) Condensation

6. The fourth state of matter is:

- (a) Solid (b) Liquid (c) Gas (d) **Plasma**

7. The forces of attraction between solid particles are:

- (a) **Very strong** (b) Weak (c) Very weak (d) Moderate

8. Liquids have:

- (a) Definite shape and volume
(b) **Indefinite shape and definite volume**
(c) Definite shape and indefinite volume



(d) Indefinite shape and volume

9. Gases are:

- (a) **Compressible.** (b) Incompressible
(c) Fixed in shape. (d) Fixed in volume

10. The random motion of suspended particles in a fluid is called:

- (a) Diffusion. (b) **Brownian motion**
(c) Condensation. (d) Evaporation

11. The ability of fluids to flow easily is called:

- (a) **Fluidity** (b) Viscosity (c) Density (d) Diffusion

12. Which of the following is an example of plasma?

- (a) Steam. (b) **Lightning.** (c) Smoke. (d) Fog

13. When a liquid changes to gas at its boiling point, the process is:

- (a) Evaporation (b) Condensation
(c) **Boiling** (d) Sublimation

14. The process of changing gas to liquid is:

- (a) Evaporation. (b) **Condensation**
(c) Melting. (d) Freezing

15. The process of changing a solid to liquid is called:

- (a) Boiling (b) Condensation (c) **Melting** (d) Freezing

16. When dry ice is left in air, it:

- (a) Melts (b) Freezes. (c) **Sublimes** (d) Condenses

17. When the temperature of water vapor drops below 0°C , it:



(a) Evaporates (b) **Condenses** (c) Freezes (d) Sublimes

18. The process opposite to sublimation is called:

(a) **Deposition** (b) Melting (c) Evaporation (d) Freezing

19. At mountain peaks, water boils below 100°C because:

(a) Pressure increases (b) **Pressure decreases**

(c) Temperature increases (d) Gravity decreases

20. Fuel consumption decreases in a pressure cooker because:

(a) **Pressure increases boiling point**

(b) Pressure decreases boiling point

(c) Temperature decreases

(d) Steam escapes

21. The particles of matter are:

(a) Stationary.

(b) **In continuous motion**

(c) At rest B.

(d) Only vibrate

22. Which of the following is a reversible change?

(a) Burning paper

(b) **Melting ice**

(c) Cooking food

(d) Rusting iron

23. The gas that diffuses faster in air is:

(a) **Ammonia**

(b) Hydrogen chloride

(c) Oxygen.

(d) Carbon dioxide

24. The change of liquid to gas below boiling point is:

(a) Boiling (b) Condensation (c) **Evaporation** (d) Melting

25. The rate of evaporation increases by:

(a) Decreasing temperature



(b) Increasing surface area

(c) Increasing humidity

(d) Removing air currents

26. Water is used in car radiators because it has:

(a) Low specific heat.

(b) High specific heat

(c) Low boiling point

(d) Low density

27. Mercury is used in thermometers because:

(a) It is cheap

(b) It has low specific heat

(c) It is solid.

(d) It is colorless

28. A cup of hot tea is an example of:

(a) Closed system.

(b) Open system

(c) Isolated system

(d) Solid system

29. A thermos flask represents:

(a) Open system

(b) Closed system

(c) Isolated system

(d) Partial system

30. A pressure cooker is an example of:

(a) Closed system.

(b) Open system

(c) Isolated system

(d) Fixed system

31. When gases are heated, their volume:

(a) Increases

(b) Decreases

(c) Remains constant

(d) Disappears

32. Solids are difficult to compress because:

(a) Their particles are far apart

(b) They have strong attraction forces



(c) They have high kinetic energy

(d) They have weak attraction forces

33. Liquids flow easily because:

(a) They have small inter particle spaces

(b) They have weak attraction forces

(c) They have strong attraction forces

(d) They have no spaces

34. The diffusion of fragrance is faster in day than at night because:

(a) High temperature.

(b) Low temperature

(c) Humidity.

(d) Pressure

35. The particles of gases move:

(a) In fixed positions

(b) Randomly

(c) In circular paths.

(d) Slowly

36. Solids have definite volume because:

(a) Their particles move freely

(b) Their particles are very close

(c) Their particles are far apart

(d) Their temperature is low

37. Liquids are not compressible because:

(a) Their particles are fixed.

(b) They have no spaces

(c) Their particles are close together

(d) They are cold

48. The inter particle spaces in gases are:

(a) Small.

(b) Very small

(c) Large.

(d) Fixed



39. When ice melts, the temperature remains constant because:

- (a) It loses heat
- (b) It gains no energy
- (c) The heat breaks attraction forces
- (d) It evaporates

Question03

Give reason for

1. The difference between the flow rate of honey and the flow rate of water.

Because the viscosity of honey is higher than that of water, as the fluidity decreases with increasing viscosity.

2. The diffusion of fragrance during the day is better than its diffusion at night.

Because the temperature during the day is higher than at night, and the speed of diffusion increases with temperature.

3. Solids have a definite shape and volume.

Because the forces of attraction between their particles are very strong, and the interparticle spaces are very small.

4. Liquids have an indefinite shape and a definite volume.

Because the forces of attraction between their particles are relatively weak, and the interparticle spaces are relatively large.

5. Gaseous matter does not have a definite shape or volume.



Because the forces of attraction between their particles are very weak, and the interparticle spaces are very large.

6. It is difficult to break a piece of rock.

Because the forces of attraction between the particles of solid rock are very strong, making the particles tightly bound together.

7. Table salt dissolves in water.

Because the forces of attraction between the water particles are relatively weak, allowing salt particles to occupy the interparticle spaces.

8. Candle smoke diffuses in air.

Because the forces of attraction between air particles are very weak, and the interparticle spaces are very large, allowing smoke to spread.

9. During melting and boiling, the temperature remains constant despite heating.

Because the absorbed heat energy is used to weaken the attraction forces between the particles.

10. The purity of substances can be verified by comparing melting or boiling points.

Because impurities affect the attraction forces between particles, changing the energy needed to change the state.

11. The boiling point of pure water is less than 100°C at mountain peaks.

Because as altitude increases, atmospheric pressure decreases, causing the boiling point to decrease.

12. Fuel consumption decreases when cooking with a pressure cooker.



Because the increased pressure raises the boiling point of water, reducing cooking time and saving fuel.

13. The boiling point of a glucose solution is higher than that of distilled water.

Because glucose increases the attraction forces between water particles, requiring more energy to change state.

14. Water droplets form on the outer surface of a cup containing iced water.

Because water vapor in the air condenses into droplets when it loses thermal energy.

15. Matter conversions between states are reversible.

Because they are physical changes not accompanied by a change in molecular composition.

16. Evaporation takes longer than boiling.

Because evaporation occurs only on the liquid surface at any temperature below boiling point.

17. Wet clothes dry faster in summer than in winter.

Because higher temperature in summer increases the rate of evaporation.

18. Evaporation rate increases with temperature.

Because more particles gain enough energy to escape from the liquid surface.

19. Evaporation rate increases when surface area increases.

Because more particles are exposed to thermal energy and can escape.

20. Evaporation rate increases when air currents increase.



Because moving air removes vapor molecules, allowing more to evaporate.

21. We feel uncomfortable in hot and humid weather.

Because high humidity reduces sweat evaporation, preventing cooling.

22. Water is an excellent cooling liquid.

Because it has a high specific heat, absorbing large amounts of heat without a large rise in temperature.

23. Mercury is used in thermometers.

Because it has low specific heat and its temperature rises quickly when heated.

24. The human body contains a large percentage of water.

Because water's high specific heat keeps body temperature constant.

25. The potential energy of solids is maximum, while that of gases is almost zero.

Because solid particles have strong attraction forces and very small inter particle spaces.

26. A cup of hot tea represents an open system.

Because both energy and matter are exchanged with the surroundings.

27. A pressure cooker represents a closed system.

Because it exchanges energy but not matter with the surroundings.

28. A thermos represents an isolated system.

Because it neither exchanges energy nor matter with the surroundings.



29. When heating oil and water equally, oil's temperature rises faster.

Because the specific heat of oil is lower than that of water.

30. Copper is preferred for heating pots.

Because copper has a lower specific heat than aluminum, so it heats up faster.

Question04

What happen if

1. A few crystals of potassium permanganate are added to a beaker containing water.

The potassium permanganate particles diffuse in the water from a region of high concentration to a region of low concentration.

2. A spoonful of sugar is stirred in a cup of water.

The sugar particles occupy the inter particle spaces between water particles, leading to the dissolving of sugar.

3. Gases are heated to extremely high temperatures in a research laboratory.

The gases become ionized, forming plasma (the fourth state of matter).

4. The piston of a syringe filled with air is pressed.

The volume of air decreases because gases are compressible.

5. The piston of a syringe filled with water is pressed.

The volume of water does not change because liquids are incompressible.



6. The piston of a syringe filled with fine sand is pressed.

The volume of sand does not change because solids are incompressible.

7. A piece of ice is left in the air for a period of time.

Ice melts and converts into water as it gains thermal energy from the surroundings.

8. Dry ice is left in the air.

Dry ice sublimates and converts directly from solid to gas when it absorbs heat.

9. Solid iodine is heated.

It sublimates to iodine vapor when heated.

10. A concentrated coffee spray is exposed to hot dry air.

The evaporation rate increases due to increased surface area of the droplets exposed to hot air.

11. A liquid substance gains thermal energy.

Its particles move faster, attraction forces decrease, and it changes to the gaseous state at boiling point.

12. Ice gains more thermal energy during melting.

The kinetic energy of its particles increases and it converts into water at 0°C .

13. The atmospheric pressure affecting pure water decreases.

The boiling point of water decreases and the melting point increases.

14. The temperature of water vapor decreases below 0°C .

It condenses into fog, dew, or clouds.

15. During melting and boiling, heating continues.



The temperature remains constant as energy is used to weaken attraction forces.

16. Wet clothes are left to dry in summer.

They dry faster because higher temperature increases the rate of evaporation.

17. Wet clothes are left to dry in winter.

They dry slowly because temperature and evaporation rate are lower.

18. Air currents increase around a liquid surface.

Evaporation rate increases because air removes water vapor molecules.

19. The temperature of a gas is raised.

The average kinetic energy of gas particles increases, causing expansion.

20. The temperature of a liquid decreases when it loses heat.

The average kinetic energy of particles decreases, leading to a temperature drop.

21. A system gains thermal energy from its surroundings.

The average kinetic energy of its particles increases and temperature rises.

22. A system loses thermal energy to its surroundings.

The average kinetic energy decreases and temperature drops.

23. Two equal masses of water and oil are heated for the same time.



The temperature of oil increases more because it has lower specific heat.

24. Two different masses of water are heated equally.

The smaller mass of water heats up more because less heat is distributed among fewer particles.

25. Two equal masses of ice and water are heated.

The temperature of ice rises more because its specific heat is lower.

26. Air pressure increases on boiling water.

The boiling point increases because higher pressure prevents molecules from escaping.

27. Air pressure decreases on boiling water.

The boiling point decreases because molecules escape more easily.

28. Steam is trapped inside a pressure cooker.

The pressure increases, raising boiling point and reducing cooking time.

29. A cup of hot tea is left uncovered.

It cools down as heat and matter are exchanged with the surroundings.

30. A metal rod is heated.

Its temperature rises as the kinetic energy of particles increases.



Question05

Compare between (in one point)

1. Solid matter vs Liquid matter

Solids have a definite shape and volume, while liquids have an indefinite shape and definite volume.

2. Liquid matter vs Gaseous matter

Liquids have a definite volume but no definite shape, while gases have neither definite shape nor volume.

3. Solid matter vs Gaseous matter

Solids have fixed shape and volume, while gases have neither fixed shape nor volume.

4. Evaporation process vs Boiling process

Evaporation occurs at any temperature on the surface; boiling occurs at a fixed temperature throughout the liquid.

5. Melting process vs Freezing process

Melting is the change from solid to liquid by gaining heat, while freezing is from liquid to solid by losing heat.

6. Evaporation process vs Condensation process

Evaporation changes liquid to gas by gaining heat, while condensation changes gas to liquid by losing heat.

7. Sublimation process vs Deposition process

Sublimation changes solid directly to gas; deposition changes gas directly to solid.

8. Open system vs Closed system

An open system exchanges both matter and energy, while a closed system exchanges only energy.



9. Closed system vs Isolated system

A closed system exchanges energy but not matter, while an isolated system exchanges neither energy nor matter.

10. Potential energy vs Kinetic energy

Potential energy is stored due to attraction forces, while kinetic energy results from particle motion.

11. Solid substances vs Liquid substances vs Gaseous substances

Solids have maximum potential energy and low kinetic energy; liquids have medium levels; gases have high kinetic and almost zero potential energy.

12. Water vs Oil when heated

Water's temperature increases slower because it has higher specific heat than oil.

13. Evaporation in summer vs winter

Evaporation is faster in summer due to higher temperature and slower in winter due to lower temperature.

14. Boiling point at sea level vs mountain top

Boiling point at sea level is 100°C ; at mountain top it's lower due to reduced atmospheric pressure.

15. Pure water vs Glucose solution

Glucose solution has a higher boiling point because impurities increase attraction forces between molecules.

16. Diffusion in hot air vs cold air

Diffusion is faster in hot air because particles have higher kinetic energy.

17. Honey vs Water in flow rate



Honey flows slower because it has higher viscosity than water.

18. Rock vs Salt solution in particle forces

Rocks have strong attraction forces and small spaces, while salt solutions have weaker forces and larger spaces.

19. Ammonia gas vs Hydrogen chloride gas diffusion

Ammonia diffuses faster because its molecular mass is lower than that of hydrogen chloride.

20. Copper vs Aluminum for heating pots

Copper is preferred because it has lower specific heat and heats up faster.

Question 06

Complete

1. Matter is anything that has _____ and occupies _____.

mass – space

2. Fluids are materials that have the property of _____ and take the shape of the _____ that contains them.

fluidity – container

3. The ability of fluids to flow easily is called **fluidity**

4. The possibility of decreasing the volume of gases by increasing the pressure exerted on them is called

compressibility

5. The movement of particles from a region of high concentration to a region of low concentration is called

diffusion



6. The random motion of large particles suspended in a fluid is known as **Brownian motion**
7. The fourth state of matter in which gas becomes a mixture of ions and free electrons is called **plasma state**
8. Solids have a definite **shape – volume**
9. Liquids have **an indefinite shape** and **definite volume**
shape – volume
10. Gases have neither definite _____ nor definite _____.
shape – volume
11. The process of changing matter from a solid to a liquid by gaining thermal energy is called **melting**
12. The process of changing matter from a liquid to a gaseous state at a specific temperature is called. **boiling**
13. The process of changing matter directly from solid to gas is called **sublimation**
14. The process of changing matter directly from gas to solid is called **deposition**
15. The temperature at which a liquid changes to a gas is called its **boiling point**
16. The temperature at which a solid changes to a liquid is called its **melting point**
17. The change of gaseous water into liquid is called _____.
condensation
18. The change of liquid water into vapor is called.
evaporation
19. During melting and boiling, the temperature
.....constant. **remains**



20. The boiling point of pure water at sea level is _____ °C
100
21. The melting point of pure ice at normal pressure is **0** °C.
22. At higher altitudes, the boiling point of water _____
because atmospheric pressure **decreases – decreases**
23. The boiling point of pure water at the Alps Mountain
(4800 m above sea level) is about _____ °C. **84**
24. When altitude increases by 300 m, the boiling point
decreases by _____ °C. **1**
25. Factors affecting the boiling point include _____ and
atmospheric pressure **– purity of the substance**
26. Evaporation rate increases by increasing **temperature**
27. Evaporation rate increases by increasing the _____ of
the liquid exposed to air. **surface area**
28. Evaporation rate increases when increases.
air currents
29. Evaporation rate decreases when _____ increases.
humidity
30. Factors affecting the rate of evaporation are _____,
_____, _____, and _____.
temperature – surface area – air currents – humidity
31. The factors affecting change in temperature of a
substance are _____, _____, and _____.
mass – type – state of matter
32. When the system gains thermal energy, its temperature
increases



33. When the system loses thermal energy, its temperature **decreases**

34. The specific heat is the amount of heat required to raise the temperature of 1 kg of a substance by 1 °C.

35. Water is used as a cooling liquid because it has high specific heat.

36. Mercury is used in thermometers because it has low specific heat.

37. The open system exchanges both energy and matter with the surroundings.

38. The closed system exchanges only energy but not matter with the surroundings.

39. The isolated system exchanges neither energy nor matter with the surroundings.

40. The sum of potential and kinetic energy of particles in a system is called internal energy.

41. A measure of the average kinetic energy of particles is called temperature.

Question 07

ComC

Calculate

1. The boiling point of water at 3000 m above sea level =

90°C

2. The boiling point of water at 4500 m above sea level =

85°C

3. When altitude increases by 300 m, the boiling point decreases by 1 c



Question0 6



1 Study the following figure, then answer:

The following diagram shows three systems:

- (1) An open container with boiling water**
- (2) A can of soft drink placed in ice**
- (3) A thermos containing a hot drink**

Question:

Match each case with its correct type of system:

- a) Open system**
- b) Closed system**
- c) Isolated system**

Answer: (1) → Open system | (2) → Closed system | (3) → Isolated system

2 What is the importance of the plasma state?

Plasma is important because it has high electrical conductivity and exists in the Sun, stars, lightning, and aurora borealis. It is also used in air conditioning systems to improve air quality by ionizing gases to break down harmful pollutants, germs, and viruses, making the air more pure.



3 What is the technological application based on surface area affecting evaporation?

Instant coffee manufacturing. When a concentrated coffee extract is sprayed into very hot dry air (about 250°C), the evaporation rate increases due to the large surface area of the coffee droplets exposed to heat, forming solid instant coffee crystals quickly.

4 Mention the factors affecting the rate of evaporation of liquids.

- 1. Temperature of the liquid.**
- 2. Surface area exposed to evaporation.**
- 3. Humidity percentage.**
- 4. Air currents.**

المشوق
إعداد
د/ سالي أحمد



كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

